


```
FFFFFFFFF 000000 RRRRRRR LL 111111 88888888
FFFFFFFFF 000000 RRRRRRR LL 111111 88888888
FF 00 00 RR RR LL 11 88 88
FF 00 00 RR RR LL 11 88 88
FF 00 00 RR RR LL 11 88 88
FF 00 00 RR RR LL 11 88 88
FFFFFFF 00 00 RRRRRRR LL 11 88888888
FFFFFFF 00 00 RRRRRRR LL 11 88888888
FF 00 00 RR RR LL 11 88 88
FF 00 00 RR RR LL 11 88 88
FF 00 00 RR RR LL 11 88 88
FF 00 00 RR RR LL 11 88 88
FF 000000 RR RR LLLLLLLLL 111111 88888888
FF 000000 RR RR LLLLLLLLL 111111 88888888
.....
```

```
LL 111111 SSSSSSSS
LL 111111 SSSSSSSS
LL 11 SS
LL 11 SS
LL 11 SS
LL 11 SS
LL 11 SSSSSS
LL 11 SSSSSS
LL 11 SS
LL 11 SS
LL 11 SS
LL 11 SS
LLLLLLLLLL 111111 SSSSSSSS
LLLLLLLLLL 111111 SSSSSSSS
```

N 9
15-Sep-1984 23:44:38
15-Sep-1984 22:44:59

VAX-11 Bliss-32 V4.0-742
_S255\$DUA28:[FORRTL.SRC]FORLIB.REQ;1

Page 1
(1)

FORTRAN Run-Time Library specific macros and symbols
File: FORLIB.REQ, Edit: SBL1003

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Author: Steven B. Lionel, 23-September-1982

1-001 - Original. SBL 23-September-1982
1-002 - Add FORMACROS.REQ. 1-Mar-1983
1-003 - Add FORRCE.R32. SBL 2-Jun-1983

This file is the master source for FORLIB.L32.
It contains definitions for macros and symbols used internally to the
FORTRAN Run-Time Library.

SWITCHES ADDRESSING_MODE (EXTERNAL=GENERAL, NONEXTERNAL=WORD_RELATIVE);
LIBRARY 'RTLSTARLE'; ! SYS\$LIBRARY:STARLET.L32
REQUIRE 'RTLML:FORERR'; ! FOR\$K_ error codes


```

: R0045 0 | *****
: R0046 0 | Created 15-SEP-1984 22:45:50 by VAX-11 SDL V2.0 Source: 15-SEP-1984 22:44:40 _S255$DUA28:[FORRTL.SRC]FORE
: R0047 0 | *****
: R0048 0 |
: R0049 0 |
: R0050 0 | *** MODULE $FORERR ***
: R0051 0 | literal FOR$K_FAC NO = 24;
: R0052 0 | literal FOR$K_NOTFORSPE = 1;
: R0053 0 | literal FOR$K_SYNERRNAM = 17;
: R0054 0 | literal FOR$K_TOOMANVAL = 18;
: R0055 0 | literal FOR$K_INVREFVAR = 19;
: R0056 0 | literal FOR$K_REWERR = 20;
: R0057 0 | literal FOR$K_DUPFILSPE = 21;
: R0058 0 | literal FOR$K_INPRECTOO = 22;
: R0059 0 | literal FOR$K_BACERR = 23;
: R0060 0 | literal FOR$K_ENDDURREA = 24;
: R0061 0 | literal FOR$K_RECNUMOUT = 25;
: R0062 0 | literal FOR$K_OPEDEFREQ = 26;
: R0063 0 | literal FOR$K_TOOMANREC = 27;
: R0064 0 | literal FOR$K_CLOERR = 28;
: R0065 0 | literal FOR$K_FILNOTFOU = 29;
: R0066 0 | literal FOR$K_OPEFAI = 30;
: R0067 0 | literal FOR$K_MIXFILACC = 31;
: R0068 0 | literal FOR$K_INVLOGUNI = 32;
: R0069 0 | literal FOR$K_ENDFILERR = 33;
: R0070 0 | literal FOR$K_UNIALROPE = 34;
: R0071 0 | literal FOR$K_SEGRECFOR = 35;
: R0072 0 | literal FOR$K_ATTACCNON = 36;
: R0073 0 | literal FOR$K_INCRECLEN = 37;
: R0074 0 | literal FOR$K_ERRDURWRI = 38;
: R0075 0 | literal FOR$K_ERRDURREA = 39;
: R0076 0 | literal FOR$K_RECIO OPE = 40;
: R0077 0 | literal FOR$K_INSVIRMEM = 41;
: R0078 0 | literal FOR$K_NO_SUCDEV = 42;
: R0079 0 | literal FOR$K_FILNAMSPE = 43;
: R0080 0 | literal FOR$K_INRECTYP = 44;
: R0081 0 | literal FOR$K_KEYVALERR = 45;
: R0082 0 | literal FOR$K_INCOPECLO = 46;
: R0083 0 | literal FOR$K_WRIREFIL = 47;
: R0084 0 | literal FOR$K_INVARGFOR = 48;
: R0085 0 | literal FOR$K_INVKEYSPE = 49;
: R0086 0 | literal FOR$K_INCKEYCHG = 50;
: R0087 0 | literal FOR$K_INCFILORG = 51;
: R0088 0 | literal FOR$K_SPERECLOC = 52;
: R0089 0 | literal FOR$K_NO_CURREC = 53;
: R0090 0 | literal FOR$K_REWRITERR = 54;
: R0091 0 | literal FOR$K_DELERR = 55;
: R0092 0 | literal FOR$K_UNLERR = 56;
: R0093 0 | literal FOR$K_FINERR = 57;
: R0094 0 | literal FOR$K_LISIO SYN = 59;
: R0095 0 | literal FOR$K_INFFORLOO = 60;
: R0096 0 | literal FOR$K_FORVARMIS = 61;
: R0097 0 | literal FOR$K_SYNERRFOR = 62;
: R0098 0 | literal FOR$K_OUTCONERR = 63;
: R0099 0 | literal FOR$K_INPCONERR = 64;
: R0100 0 | literal FOR$K_OUTSTAOVE = 66;
: R0101 0 | literal FOR$K_INPSTAREQ = 67;
```

C 10
15-Sep-1984 23:44:38
15-Sep-1984 22:45:53

VAX-11 Bliss-32 V4.0-742
_S255\$DUA28:[FORRTL.OBJ]FORERR.R32;1 Page 3
(1)

```
.. R0102 0 literal FOR$K_VFEVALERR = 68;  
.. R0103 0 literal FOR$K_INTOVF = 70;  
.. R0104 0 literal FOR$K_INTZERDIV = 71;  
.. R0105 0 literal FOR$K_FLOOVE = 72;  
.. R0106 0 literal FOR$K_FLOZERDIV = 73;  
.. R0107 0 literal FOR$K_FLOUND = 74;  
.. R0108 0 literal FOR$K_DECSTROVE = 76;  
.. R0109 0 literal FOR$K_ARRREFOUT = 77;  
.. R0110 0 literal FOR$K_ADJARRDIM = 93;  
.. R0111 0 literal FOR$K_MAX_ERR = 93;
```

0 10
15-Sep-1984 23:44:38
15-Sep-1984 22:44:59

VAX-11 Bliss-32 V4.0-742
_S255\$DUA28:[FORRTL.SRC]FORLIB.REQ;1 Page 4
(1)

: 0112 0
: 0113 0

REQUIRE 'RTLIN:FORFMT';

! FORMAT codes and fields

File: FORFMT.REQ Edit: JAW1004

* This file, FORFMT.REQ, defines symbols for the VAX-11 FORTRAN
formatting routines.

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Revision History:

0-12 - Change name to FORFMT.REQ JBS 14-NOV-78
1-001 - Add copyright notice and change version number JBS 16-NOV-78
1-002 - Add FORTRAN-77 format codes. SBL 09-Feb-1979
1-003 - Remove PRINT statement, for new BLISS compiler. JBS 02-OCT-1979
1-004 - Add V_RC_TYPE_BYTE and V_RC_TYPE_WORD. JAW 10-Aug-1981
--

* Define format code byte

MACRO
V_FMT_CODE = 0,0,7,0 %; ! 7-bit format code
V_FMT_REPRE = 0,7,1,0 %; ! Optional representation byte present?

MACRO
* Optional format representation byte:
* The following are bits in the optional format representation
* byte. The byte is copied into local BLOCK
* B_FMT_REPRESENT. These flags indicate less
* frequently used sizes of the format code representations.
--

V_RC_TYPE = 0,0,2,0 %, Repeat count type:
0 = not present, 1 = byte, 2 = word
V_RC_TYPE_BYTE = 0,0,1,0 %,
V_RC_TYPE_WORD = 0,1,1,0 %,
V_W_WORD = 0,2,1,0 %, 0=W field is byte, 1=W field is word.
Bit 3 is reserved to DEC
V_E_VFE = 0,4,1,0 %, E field is VFE
V_D_VFE = 0,5,1,0 %, D field is VFE
V_W_VFE = 0,6,1,0 %, W field is a VFE (ignore V_W_WORD)
V_RC_VFE = 0,7,1,0 %: Repeat count field is a VFE
ignore V_RC_BYTE and V_RC_WORD)

Define format code symbols which are is 2 or 3 characters so it plus comma will fit
in between logical tabs. One character symbols are prefixed with so
that they are two character symbols instead (so won't conflict with LOCALs).

| | | | | |
|---------|---------------|-------|----------------------------------|---|
| LITERAL | ER | = 0, | 00 | Format syntax error - only from object time format compiler |
| | LP | = 1, | 01 | (- Format reversion point |
| | NLP | = 2, | 02 | n(- Left paren of repeat group |
| | RP | = 3, | 03 |) - Right paren of repeat group |
| | EOF | = 4, | 04 |) - End of format |
| | SLS | = 5, | 05 | / - Record separator |
| | DLR | = 6, | 06 | \$ - Dollar sign: terminal I/O |
| | | | do not return to left margin | |
| | CLN | = 7, | 07 | : - Colon: terminate if end of list |
| | | | so no trailing Hollerith printed | |
| | S | = 9, | 09 | S - Restore + optional |
| | SP | = 10, | 0A | SP - Force + on |
| | SS | = 11, | 0B | SS - Force + off |
| | P | = 12, | 0C | sP - signed scale factor (-128 =< s =< +127). |
| | T | = 13, | 0D | Tn - Tab Set (0 < n =< 32767) |
| | X | = 14, | 0E | nX - Skip n columns (0 < n =< 32767) |
| | H | = 15, | 0F | nHcccc - Hollerith: n chars follow (0 < n =< 32767) |
| | BN | = 16, | 10 | BN - Blanks are nulls |
| | BZ | = 17, | 11 | BZ - Blanks are zeroes |
| | TL | = 18, | 12 | TLc - Tab left c columns |
| | TR | = 19, | 13 | TRc - Tab right c columns |
| | Q | = 20, | 14 | Q - no. of input chars left in record |
| | A | = 21, | 15 | nAw - Alpha numeric |
| | -MIN DATA = A | | | Minimum I/O list transmitting data code |
| | -L | = 22, | 16 | nLw - Locial |
| | -MIN INT = L | | | Min. integer |
| | -O | = 23, | 17 | nOw - Octal |
| | -I | = 24, | 18 | nIw - Integer |
| | -Z | = 25, | 19 | nZw - Hexadecimal |
| | XO | = 26, | 1A | Ow.m - Extended 0 |
| | XI | = 27, | 1B | Iw.m - Extended I |
| | XZ | = 28, | 1C | Zw.m - Extended Z |
| | -MAX INT = XZ | | | Max. integer (not counting defaults) |

R0228 0
R0229 0
R0230 0
R0231 0
R0232 0
R0233 0
R0234 0
R0235 0
R0236 0
R0237 0
R0238 0
R0239 0
R0240 0
R0241 0
R0242 0
R0243 0
R0244 0
R0245 0
R0246 0
R0247 0
R0248 0
R0249 0
R0250 0
R0251 0
R0252 0
R0253 0
R0254 0
R0255 0
R0256 0
R0257 0
R0258 0
R0259 0
R0260 0
R0261 0
R0262 0

```

-F      = 30,      1E
  _MIN_FLT = -F, 1F
-E      = 31,      20
-G      = 32,      21
-D      = 33,      22
XE      = 34,      23
XG      = 35,      23
  MAX_FLT = XG,
  MAX_DATA = XG,

```

+ Default format codes:
-

```

-DA      = 41,      29
-DL      = 42,      2A
-DO      = 43,      2B
-DI      = 44,      2C
-DZ      = 45,      2D

-DF      = 50,      32
-DE      = 51,      33
-DG      = 52,      34
-DD      = 53,      35

```

```

nFw.d - Fixed format
Min. floating
nEw.d - Scientific notation format
nGw.d - General format
nDw.d - Double Precision format
nEw.dEe - Extended E
nGw.dEe - Extended G
max. floating (not counting default)
Max. data (not counting default)

```

```

nA - default A
nL - default L
nO - default O
nI - default I
nZ - default Z

nF - default F
nE - default E
nG - default G
nD - default D

```

+ Note: 0 < n =< 32767 (decimal)
0 < w =< 65535 (decimal)
0 =< d =< 255 (decimal)
0 =< e =< 255 (decimal)
-

: End of file FORFMT.REQ

M 10
15-Sep-1984 23:44:38
15-Sep-1984 22:44:59

VAX-11 Bliss-32 V4.0-742
_S255\$DUA28:[FORRTL.SRC]FORLIB.REQ;1 Page 8 (1)

: 0263 0
: 0264 0

REQUIRE 'RTLIN:FORMACROS';

! FORTRAN-specific macros

Macros for FORTRAN Run-Time Library
File: FORMACROS.REQ, Edit: SBL1001

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Author: Steven B. Lionel, 7-Jan-1983

1-001 - Original. SBL 7-Jan-1983

*
Macro to call FOR\$\$SIGNAL_STO and return. This saves lines of code
in the source. It can replace a call to FOR\$\$SIGNAL_STO anywhere.
_

MACRO

```
$FOR$$SIGNAL_STO (signame) =  
  BEGIN  
    FOR$$SIGNAL_STO (signame  
      IF %NULL(%REMAINING)  
      THEN  
      ELSE  
        ,%REMAINING  
      IF  
    );  
  RETURN 0;  
  END %;
```

*
Structure definitions used to declare the FAB and NAM as being offset from
CCB. To use, make the following declarations:

```
BIND  
  FAB = CCB: REF $FOR$FAB_CCB_STRUCT,  
  NAM = CCB: REF $FOR$NAM_CCB_STRUCT;
```


J 10
15-Sep-1984 23:44:38
15-Sep-1984 22:45:03

VAX-11 Bliss-32 V4.0-742
[FORRTL.SRC]FORMACROS.REQ;1

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RO322
RO323
RO324
RO325
RO326
RO327
RO328
RO329
RO330
RO331
RO332
RO333
RO334

0
0
0
0
0
0
0
0
0
0
0
0
0

!-
STRUCTURE
\$FOR\$FAB CCB STRUCT [O, P, S, E] =
[FAB\$C_BLN]
(\$FOR\$FAB_CCB_STRUCT+RAB\$C_BLN+O)<P,S,E>.
\$FOR\$NAM CCB STRUCT [O, P, S, E] =
[NAM\$C_BLN]
(\$FOR\$NAM_CCB_STRUCT+RAB\$C_BLN+FAB\$C_BLN+O)<P,S,E>;
! End of file FORMACROS.REQ

K 10
15-Sep-1984 23:44:38
15-Sep-1984 22:44:59

VAX-11 Bliss-32 V4.0-742
_S255SDUA28:[FORRTL.SRC]FORLIB.REQ;1 Page 11
(1)

: 0335 0
: 0336 0

REQUIRE 'RTLML:FORMSG';

! FOR\$ _error codes

Created 15-SEP-1984 22:46:32 by VAX-11 SDL V2.0 Source: 15-SEP-1984 22:45:39 _\$255\$DUA28:[FORRTL.OBJ]FORM

*** MODULE \$FORDEF ***

This SDL File Generated by VAX-11 Message V04-00 on 15-SEP-1984 22:45:40.89

FILE: FORMSG.MSG EDIT: SBL2006

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- 1-014 - ADD ERRORS 17-19 FOR NAMELIST. SBL 10-NOV-1980
- 1-015 - CORRECT TYPO IN TOOMANVAL. SBL 15-DEC-1980
- 1-016 - RESTORE CLOSING BRACKET ON OPEDEFREQ, MYSTERIOUSLY DROPPED IN 1-015.
SBL 6-JAN-1981
- 2-001 - CONVERT TO MESSAGE UTILITY SOURCE FORMAT. ADAPTED FROM FORMSG.MDL
VERSION 1-016. SBL 22-APR-1981
- 2-002 - ADD UNFIO_FMT, FMTIO_UNF, DIRIO_KEY, SEQIO_DIR, KEYIO_DIR,
IO_NONFOR, INVXTREC, FLOUNDEXC. JAW 23-AUG-1981
- 2-003 - CHANGE INVXTREC TO INVTEXREC. JAW 24-AUG-1981
- 2-004 - ADD INVTEX WHICH DOES NOT REQUIRE A RECORD NUMBER. THIS IS FOR INDEXED
AND INTERNAL FILES THAT DO NOT HAVE A VALID RECORD NUMBER. DGP 21-DEC-9181
- 2-005 - ADD .TITLE. SBL 28-AUG-1982
- 2-006 - ADD OPEREQDIS AND OPEREQSEQ. SBL 2-JUN-1983

SYMBOLS ARE DEFINED FOLLOWING THE STANDARD FOR GLOBAL NAMES:

FOR\$_ABCMNOXYZ

IN ADDITION, THE LIBRARY STANDARDS SPECIFY THAT THE LETTERS "abc", "mno",
AND "xyz" ARE THE FIRST THREE LETTERS OF THE FIRST THREE WORDS OF THE ERROR
MESSAGE, NOT COUNTING ARTICLES AND PREPOSITIONS.

R0394 0
R0395 0
R0396 0
R0397 0
R0398 0
R0399 0
R0400 0
R0401 0
R0402 0
R0403 0
R0404 0
R0405 0
R0406 0
R0407 0
R0408 0
R0409 0
R0410 0
R0411 0
R0412 0
R0413 0
R0414 0
R0415 0
R0416 0
R0417 0
R0418 0
R0419 0
R0420 0
R0421 0
R0422 0
R0423 0
R0424 0
R0425 0
R0426 0
R0427 0
R0428 0
R0429 0
R0430 0
R0431 0
R0432 0
R0433 0
R0434 0
R0435 0
R0436 0
R0437 0
R0438 0
R0439 0
R0440 0
R0441 0
R0442 0
R0443 0
R0444 0
R0445 0
R0446 0
R0447 0
R0448 0
R0449 0
R0450 0

THE NAMES OF ALL PROCEDURES USING EACH ERROR CONDITION VALUE SHOULD APPEAR
IN THE COMMENTS INCLUDED WITH EACH ERROR DEFINITION.

MACRO-32 PROGRAMMING:

THE MACROS CALL:

\$FORDEF

WILL CAUSE ALL SYMBOLS TO BE MADE AVAILABLE TO THE MODULE.
THE STSSV MSG_ID IS THE FORTRAN ERROR NUMBER (1:94).
THESE SYMBOLS ARE DECLARED EXTERNAL BY THE RUN-TIME LIBRARY.
THE MACROS ARE PROVIDED ONLY FOR THE CONVENIENCE OF THE USER.

```

; MAKE ALL ERRORS BE SEVERE (EXCEPT AS NOTED)
; SET SUB-SYSTEM SPECIFIC BIT AND MAKE SEVERE
; SET LH TO 24 (DECIMAL).
Literal FOR$_FACILITY = 24;
Literal FOR$_NOTFORSPE = 1605644;
; NEVER SIGNALLED. USED ONLY AS A FORTRAN ERROR
; NUMBER FOR ERRSNS TO MEAN SOME OTHER FACILITY
; THAN FOR$ OR MTH$ DETECTED THE ERROR.
; SET SUB-SYSTEM SPECIFIC BIT AND MAKE SEVERE
; SET LH TO 24 (DECIMAL).
Literal FOR$_SYNERRNAM = 1605772;
Literal FOR$_TOOMANVAL = 1605780;
Literal FOR$_INVREFVAR = 1605788;
Literal FOR$_REWERR = 1605796;
Literal FOR$_DUPFILSPE = 1605804;
Literal FOR$_INPRECTOO = 1605812;
Literal FOR$_BACERR = 1605820;
Literal FOR$_ENDDURREA = 1605828;
Literal FOR$_RECNUMOUT = 1605836;
Literal FOR$_OPEDEFREQ = 1605844;
Literal FOR$_TOOMANREC = 1605852;
Literal FOR$_CLOERR = 1605860;
Literal FOR$_FILNOTFOU = 1605868;
Literal FOR$_OPEFAI = 1605876;
Literal FOR$_MIXFILACC = 1605884;
Literal FOR$_INVLOGUNI = 1605892;
Literal FOR$_ENDFILERR = 1605900;
Literal FOR$_UNIALROPE = 1605908;
Literal FOR$_SEGRCFOR = 1605916;
Literal FOR$_ATTACCNON = 1605924;
Literal FOR$_INCRECLEN = 1605932;
Literal FOR$_ERRDURWRI = 1605940;
Literal FOR$_ERRDURREA = 1605948;
Literal FOR$_RECIO OPE = 1605956;
Literal FOR$_INSVIRMEM = 1605964;
Literal FOR$_NO SUCDEV = 1605972;
Literal FOR$_FILNAMSP = 1605980;
Literal FOR$_INCRECTYP = 1605988;
Literal FOR$_KEYVALERR = 1605996;
Literal FOR$_INCOPECLO = 1606004;
Literal FOR$_WRIREAFIL = 1606012;
Literal FOR$_INVARGFOR = 1606020;

```

N 10
15-Sep-1984 23:44:38
15-Sep-1984 22:46:38

VAX-11 Bliss-32 V4.0-742
_S255SDUA28:[FORRTL.OBJ]FORMSG.R32;1

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```
R0451 0 literal FOR$ INVKEYSPE = 1606028;
R0452 0 literal FOR$ INCKEYCHG = 1606036;
R0453 0 literal FOR$ INCFILORG = 1606044;
R0454 0 literal FOR$ SPERECLOC = 1606052;
R0455 0 literal FOR$ NO CURREC = 1606060;
R0456 0 literal FOR$ REWRITERR = 1606068;
R0457 0 literal FOR$ DELERR = 1606076;
R0458 0 literal FOR$ UNLERR = 1606084;
R0459 0 literal FOR$ FINERR = 1606092;
R0460 0 literal FOR$ MORONEREC = 1605852;
R0461 0 literal FOR$ ATTREANON = 1605924;
R0462 0 ; SET SUB-SYSTEM SPECIFIC BIT AND MAKE SEVERE
R0463 0 literal FOR$ LISIO SYN = 1606108;
R0464 0 literal FOR$ INFFORLOO = 1606116;
R0465 0 literal FOR$ FORVARMIS = 1606124;
R0466 0 literal FOR$ SYNERRFOR = 1606132;
R0467 0 ; SET SUB-SYSTEM SPECIFIC BIT AND MAKE ERROR (NOT SEVERE)
R0468 0 literal FOR$ OUTCONERR = 1606138;
R0469 0 ; SET SUB-SYSTEM SPECIFIC BIT AND MAKE SEVERE
R0470 0 literal FOR$ INPCONERR = 1606148;
R0471 0 ; SET SUB-SYSTEM SPECIFIC BIT AND MAKE SEVERE
R0472 0 literal FOR$ OUTSTAOVE = 1606164;
R0473 0 literal FOR$ INPSTAREQ = 1606172;
R0474 0 literal FOR$ VFEVALERR = 1606180;
R0475 0 ; SET SUB-SYSTEM SPECIFIC BIT AND MAKE SEVERE
R0476 0 literal FOR$ ADJARRDIM = 1606380;
R0477 0 *****
R0478 0 THE FOLLOWING MESSAGES ARE SECONDARY MESSAGES, OR ARE USED ONLY IN
R0479 0 EXIT HANDLERS, AND THEREFORE DO NOT NEED TO BE (AND SHOULD NOT BE)
R0480 0 CONTIGUOUS WITH THE MESSAGES ABOVE.
R0481 0 THE NEXT SIX MESSAGES ARE SECONDARY MESSAGES FOR USE WITH MIXFILACC IN
R0482 0 FOR$$IO BEG AND FOR$$CB.
R0483 0 literal FOR$ UNFIO_FMT = 1607684;
R0484 0 literal FOR$_FMTIO_UNF = 1607692;
R0485 0 literal FOR$ DIRIO_KEY = 1607700;
R0486 0 literal FOR$ SEQIO_DIR = 1607708;
R0487 0 literal FOR$ KEYIO_DIR = 1607716;
R0488 0 literal FOR$ IO_NONFOR = 1607724;
R0489 0 THE NEXT TWO MESSAGES ARE SECONDARY MESSAGES FOR USE WITH INPCONERR IN
R0490 0 FOR$$UDF WF AND FOR$$UDF WL.
R0491 0 literal FOR$ INVTEXREC = 1607732;
R0492 0 literal FOR$ INVTEX = 1607740;
R0493 0 ADDITIONAL SECONDARY MESSAGES
R0494 0 literal FOR$ OPEREQDIS = 1607748;
R0495 0 literal FOR$ OPEREQSEQ = 1607756;
R0496 0 THE NEXT MESSAGE IS A PRIMARY MESSAGE USED IN THE EXIT HANDLER WHICH
R0497 0 IS DECLARED BY FUR$HANDLER.
R0498 0 literal FOR$ FLOUNDEXC = 1608035;
R0499 0 END OF SPECIAL MESSAGES
R0500 0 *****
```

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: 0501 0
: 0502 0

REQUIRE 'RTLIN:FORMML';

! NAMELIST definitions

! FORMML.REQ - NAMELIST NMLS Definitions - Version 1-002 - Edit: SBL1002

```
*****
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*****
```

! AUTHOR: Steven B. Lionel

! EDIT HISTORY:

! 1-001 - Original. SBL 21-August-1980
! 1-002 - Add NMLSV_SUBSCRIPT. SBL 15-April-1981

LITERAL

NMLSK_BLKLENGTH = TPASK_LENGTH0 + 120; ! TPARSE parameter block length

FIELD

NML\$FIELDS =

! The following fields are part of the TPARSE parameter block past that
! used by LIB\$TPARSE.

SET

| | | | |
|-----------------|---|---------------------------------|-----------------------------|
| NMLSA_LISTBLOCK | = | [TPASK_LENGTH0 + 00, 0, 32, 0], | ! NAMELIST descriptor block |
| NMLSA_VARNAME | = | [TPASK_LENGTH0 + 04, 0, 32, 0], | ! Variable name |
| NMLSA_VARSTART | = | [TPASK_LENGTH0 + 08, 0, 32, 0], | ! Variable start address |
| NMLSA_VAREND | = | [TPASK_LENGTH0 + 12, 0, 32, 0], | ! Variable end address |
| NMLSA_VARCUR | = | [TPASK_LENGTH0 + 16, 0, 32, 0], | ! Current position |
| NMLSV_VARSIZE | = | [TPASK_LENGTH0 + 20, 0, 16, 0], | ! Segment size |
| NMLSV_STRIDE | = | [TPASK_LENGTH0 + 22, 0, 16, 0], | ! Stride between elements |
| NMLSA_DESCR | = | [TPASK_LENGTH0 + 24, 0, 32, 0], | ! Address of descriptor |
| NMLSA_CCB | = | [TPASK_LENGTH0 + 28, 0, 32, 0], | ! Address of CCB |
| NMLSB_DTYPE | = | [TPASK_LENGTH0 + 32, 0, 08, 0], | ! Variable datatype |
| NMLSV_SUBSTRING | = | [TPASK_LENGTH0 + 33, 0, 01, 0], | ! Set if substring |
| NMLSV_IMAG | = | [TPASK_LENGTH0 + 33, 1, 01, 0], | ! Set if imaginary part |

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R0560 0
R0561 0
R0562 0
R0563 0
R0564 0
R0565 0
R0566 0
R0567 0
R0568 0
R0569 0
R0570 0
R0571 0
R0572 0
R0573 0
R0574 0
R0575 0
R0576 0
R0577 0

NML\$V_VALUE_IDENT =
NML\$V_SUBSCRIPT = [TPASK_LENGTH0 + 33, 2, 01, 0],
NML\$B_CONSTYPE = [TPASK_LENGTH0 + 33, 3, 01, 0],
NML\$L_CURIDX = [TPASK_LENGTH0 + 34, 0, 08, 0],
NML\$L_SUBSCR = [TPASK_LENGTH0 + 36, 0, 32, 0],
NML\$L_SUBSTRLO = [TPASK_LENGTH0 + 40, 0, 32, 0],
NML\$L_SUBSTRHI = [TPASK_LENGTH0 + 40, 0, 32, 0],
NML\$L_CONSBLOCK = [TPASK_LENGTH0 + 44, 0, 32, 0],
NML\$L_REPEATCT = [TPASK_LENGTH0 + 68, 0, 32, 0],
NML\$T_TOKEN = [TPASK_LENGTH0 + 84, 0, 08, 0]

TES;

! End of FORMML.REQ

| Set if last token was an identifier
| Set of a subscript has been seen
| Constant type
| Current index number
| Subscripts (7 longwords)
| Low substring column
| High substring column
| Constant storage block
| 4 longwords
| Repeat count
| Last token if
| it could be an
| identifier.
| 32 bytes long.

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: 0578 0
: 0579 0

REQUIRE 'RTLIN:FOROPN';

! OPEN definitions

This file, FOROPN.REQ, defines the VAX-11 FORTRAN OPEN,
CLOSE and INQUIRE keywords and literal values. Edit: SBL1023

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- 0-21 - Move parameter encoding symbols for FOR\$\$IOBEG to FPAR. TNH 30-May-78
- 0-22 - And symbol for statement types. TNH 30-May-78
- 0-23 - Change name to FOROPN.REQ JBS 14-NOV-78
- 1-001 - Increment version number and add copyright notice JBS 16-NOV-78
- 1-002 - Add Some symbolics to define the special LUN numbers for Basic
PRINT, INPUT, READ. DGP 05-Dec-78
- 1-003 - Add necessary symbolics for ISAM. SBL 06-Dec-78
- 1-004 - Change file name from FOROPN.REQ to OTSOPN.REQ. JBS 06-DEC-78
- 1-005 - Remove the statement type constants. Moved to LUB. DGP 06-Dec-78
- 1-006 - Change back to FOROPN. Move more constants to LUB. DGP 08-Dec-78
- 1-007 - Fix some comments to reflect the change back to FOROPN. JBS 12-DEC-78
- 1-008 - Add DISP='SUBMIT'. SBL 09-Feb-1979
- 1-009 - Change ORG IND to ORG IDX. Add new arg type. SBL 03-Apr-79
- 1-010 - Add new definitions for ISAM. SBL 6-Apr-79
- 1-011 - Give BLANK= literal values. SBL 12-Apr-79
- 1-012 - Add OPENS\$K DIS SUDE and OPENS\$K DIS PRDE. SBL 19-Apr-79
- 1-013 - Add OPENS\$K IOSTAT L. SBL 27-Apr-79
- 1-014 - Add INQUIRE keywords. SBL 27-Apr-79
- 1-015 - Because OPEN and CLOSE use the IOSTAT keywords, make the
symbols that control the size of their keyword arrays
cover them. JBS 01-MAY-1979
- 1-016 - Reassign INQUIRE keywords. SBL 01-May-1979
- 1-017 - Add INQUIRE keyword values for ORGANIZATION, RECORDTYPE
and KEYED. SBL 2-Aug-1979
- 1-018 - Add OPENS\$K ARG B R. SBL 7-August-1979
- 1-019 - Remove PRINT statement, for new BLISS compiler. JBS 02-OCT-1979
- 1-020 - Add CARRIAGECONTROL for INQUIRE. SBL 4-Dec-1979

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- 1-021 - ISAM KEY positions in the OPEN arg list are signed longwords,
not words. The key length should be an unsigned byte. SBL 12-Mar-1980
1-022 - Add OPENS\$ DEFAULT and INOS\$ DEFAULT. JAW 30-Jun-1981
1-023 - Add STREAM, STREAM_CR and STREAM_LF values for RECORDTYPE. SBL 1-Mar-1983

--
*
Define symbols for FORTRAN OPEN keywords of form: OPENS\$ symbol
Define literal values of form: OPENS\$_abc_xyz where abc is
first three letters of keyword and xyz are the first three
letters of the literal.
Define symbols in alphabetical order.

LITERAL

OPENS\$_ACCESS = 4,
OPENS\$_ACC_DIR = 1,
OPENS\$_ACC_SEQ = 2,
OPENS\$_ACC_APP = 3,
OPENS\$_ACC_KEY = 4,

OPENS\$_ASSOCIAT = 17,
OPENS\$_ASSOC_L = 0,

OPENS\$_BLANK = 24,
OPENS\$_BLK_ZER = 1,
OPENS\$_BLK_NUL = 2,

OPENS\$_BLOCKSIZ = 18,
OPENS\$_BUFFERCO = 9,
OPENS\$_CARRIAGE = 7,

OPENS\$_CAR_FOR = 1,
OPENS\$_CAR_LIS = 2,
OPENS\$_CAR_NON = 3,

OPENS\$_DEFAULTF = 26,
OPENS\$_DISPOSE = 2,
OPENS\$_DIS_SAV = 1,
OPENS\$_DIS_DEL = 2,
OPENS\$_DIS_PRI = 3,
OPENS\$_DIS_SUB = 4,
OPENS\$_DIS_PRDE = 5,
OPENS\$_DIS_SUDE = 6,

OPENS\$_ERR = 3,
OPENS\$_EXTENDS = 11,
OPENS\$_FORM = 5,

OPENS\$_FOR_FOR = 1,
OPENS\$_FOR_UNF = 2,
OPENS\$_FOR_UN = -1,

OPENS\$_INITIALS = 10,
OPENS\$_IOSTAT = 22,
OPENS\$_IOSTAT_L = 25,

OPENS\$_KEY = 23,

ACCESS

= 'DIRECT'
= 'SEQUENTIAL'
= 'APPEND'
= 'KEYED'

ASSOCIATEDVARIABLE

1 if associated variable is a longword
0 if just a word. Note: this parameter
is not generated by the compiler!
It is needed after all keywords are converted to
32-bit values.

BLANK

= 'ZERO'
= 'NULL'

BLOCKSIZE

BUFFERCOUNT

CARRIAGE CONTROL

= 'FORTRAN'
= 'LIST'
= 'NONE'

DEFAULTFILE

DISPOSE

= 'SAVE'
= 'DELETE'
= 'PRINT'
= 'SUBMIT'
= 'PRINT/DELETE'
= 'SUBMIT/DELETE'

ERR

EXTENDSIZE

= 'FORM'
= 'FORMATTED'
= 'UNFORMATTED'
= 'UNSPECIFIED'

Note: this is not generated by compiler.
It is used by default OPEN only.

INITIALSIZE

IOSTAT

1 if IOSTAT is a longword,
0 if a word. This is not generated
by the compiler.

KEY

R0694 0
R0695 0
R0696 0
R0697 0
R0698 0
R0699 0
R0700 0
R0701 0
R0702 0
R0703 0
R0704 0
R0705 0
R0706 0
R0707 0
R0708 0
R0709 0
R0710 0
R0711 0
R0712 0
R0713 0
R0714 0
R0715 0
R0716 0
R0717 0
R0718 0
R0719 0
R0720 0
R0721 0
R0722 0
R0723 0
R0724 0
R0725 0
R0726 0
R0727 0
R0728 0
R0729 0
R0730 0
R0731 0
R0732 0
R0733 0
R0734 0
R0735 0
R0736 0
R0737 0
R0738 0
R0739 0
R0740 0
R0741 0
R0742 0
R0743 0
R0744 0
R0745 0
R0746 0
R0747 0
R0748 0
R0749 0
R0750 0

```

OPENS$K_MAXREC = 16,
OPENS$K_NAME = 14,
OPENS$K_NOSPANBL = 12,
OPENS$K_USEROPEN = 21,
OPENS$K_ORGANIZA = 19,
    OPENS$K_ORG_SEQ = 1,
    OPENS$K_ORG_REL = 2,
    OPENS$K_ORG_IDX = 3,
    OPENS$K_ORG_HAS = 4,
    OPENS$K_ORG_STR = 5,
OPENS$K_READONLY = 8,
OPENS$K_RECORDTY = 20,
    OPENS$K_REC_FIX = 1,
    OPENS$K_REC_VAR = 2,
    OPENS$K_REC_SEGM = 3,
    OPENS$K_REC_STM = 4,
    OPENS$K_REC_STMCR = 5,
    OPENS$K_REC_STMLF = 6,
OPENS$K_RECORDSI = 6,
OPENS$K_SHARED = 13,
OPENS$K_TYPE = 15,
    OPENS$K_TYP_OLD = 1,
    OPENS$K_TYP_NEW = 2,
    OPENS$K_TYP_SCR = 3,
    OPENS$K_TYP_UNK = 4,
OPENS$K_UNIT = T,

```

```

MAXREC
NAME
NOSPANBLOCKS
USEROPEN
ORGANIZATION
    = 'SEQUENTIAL'
    = 'RELATIVE'
    = 'INDEXED'
    = 'HASHED'
    = 'STREAM'
READONLY
RECORDTYPE
    = 'FIXED'
    = 'VARIABLE'
    = 'SEGMENTED'
    = 'STREAM'
    = 'STREAM_CR'
    = 'STREAM_LF'
RECORDSIZE
SHARED
TYPE
    = 'OLD'
    = 'NEW'
    = 'SCRATCH'
    = 'UNKNOWN'
UNIT

```

```

OPENS$K_KEY_MAX = OPENS$K_DEFAULTF, ! Max. open parameter
CLOS$K_KEY_MAX = OPENS$K_DEFAULTF; ! Max. CLOSE parameter

```

Key numbers 27-29 are reserved for future OPEN/CLOSE use.

INQUIRE keyword definitions

LITERAL

```

INQ$K_FILE = OPENS$K_NAME,
INQ$K_DEFAULTF = OPENS$K_DEFAULTF,
INQ$K_UNIT = OPENS$K_UNIT,
INQ$K_IOSTAT = OPENS$K_IOSTAT,
INQ$K_IOSTAT_L = OPENS$K_IOSTAT_L,

```

```

INQ$K_ERR = OPENS$K_ERR,
INQ$K_EXIST = 30,
INQ$K_OPENED = 31,
INQ$K_NUMBER = 32,
INQ$K_NAMED = 33,
INQ$K_NAME = 34,
INQ$K_ACCESS = 35,
INQ$K_SEQUENTIAL = 36,
INQ$K_DIRECT = 37,
INQ$K_FORM = 38,
INQ$K_FORMATTED = 39,
INQ$K_UNFORMATT = 40,

```

```

! Input file name
! Defaultfile
! Input unit number
! IOSTAT
! 1 if IOSTAT is a longword
! 0 if a word
! 1 if ERR= present
! File exists?
! File opened?
! Open on what unit?
! Does it have a name?
! What's its name?
! Access mode?
! Is it sequential?
! Is it direct?
! What's the form?
! Formatted?
! Unformatted?

```

R0751 0
 R0752 00
 R0753 00
 R0754 00
 R0755 00
 R0756 00
 R0757 00
 R0758 00
 R0759 00
 R0760 00
 R0761 00
 R0762 00
 R0763 00
 R0764 00
 R0765 00
 R0766 00
 R0767 00
 R0768 00
 R0769 00
 R0770 00
 R0771 00
 R0772 00
 R0773 00
 R0774 00
 R0775 00
 R0776 00
 R0777 00
 R0778 00
 R0779 00
 R0780 00
 R0781 00
 R0782 00
 R0783 00
 R0784 00
 R0785 00
 R0786 00
 R0787 00
 R0788 00
 R0789 00
 R0790 00
 R0791 00
 R0792 00
 R0793 00
 R0794 00
 R0795 00
 R0796 00
 R0797 00
 R0798 00
 R0799 00
 R0800 00
 R0801 00
 R0802 00
 R0803 00
 R0804 00
 R0805 00
 R0806 00
 R0807 0

INQSK_RECL = 41,
 INQSK_NEXTREC = 42,
 INQSK_BLANK = 43,
 INQSK_ORGANIZAT = 44,
 INQSK_RECORDTYP = 45,
 INQSK_KEYED = 46,
 INQSK_CARRIAGE = 47,

! What's the recordsize?
 ! What's the next record
 ! What are blanks?
 ! What's the organization?
 ! What's the recordtype?
 ! KEYED allowed?
 ! What's the carriage control?

INQSK_KEY_MAX = INQSK_CARRIAGE;

!+
 ! Define FORTRAN OPEN argument type codes.
 ! Used in field OPENS\$B_ARG_TYPE
 !-

LITERAL

OPENS\$K_ARG_NULL = 0, ! keyword with no value
 OPENS\$K_ARG_LIT = 1, ! literal value in W_INFO_WORD
 OPENS\$K_ARG_W_V = 2, ! expression in W_INFO_WORD
 OPENS\$K_ARG_W_R = 3, ! next actual is adr. of word
 OPENS\$K_ARG_L_V = 4, ! next actual is longword value
 OPENS\$K_ARG_L_R = 5, ! next actual is adr. of longword value
 OPENS\$K_ARG_TZ_R = 6, ! next actual is adr. of ASCII string
 ! (needed for compatibility- descriptor
 ! is the preferred form)
 OPENS\$K_ARG_T_DS = 7, ! next actual is adr. of string descriptor
 OPENS\$K_ARG_ZI = 8, ! next actual is proc. adr.
 OPENS\$K_ARG_INLN = 9, ! next INFO_WORD longwords are arg.
 OPENS\$K_ARG_B_R = 10, ! next actual is address of byte

OPENS\$K_ARG_MAX = OPENS\$K_ARG_B_R; ! max. arg type code

!+
 ! Define fields within FORTRAN OPEN parameters
 !-

MACRO

OPENS\$B_KEY = 0,0,8,0 %, ! keyword code. Codes are of form:
 OPENS\$K_keyname
 OPENS\$B_ARG_TYPE = 0,8,8,0 %, ! arg type code. Codes are
 of form: OPENS\$K_ARG_type
 OPENS\$W_INFO = 0,16,16,1 %, ! 16-bit information.
 ! sign extend to 32-bits.
 OPENS\$A_VALUE = 0,0,%BPADDR,0 %, ! Address of value - in next
 position in parameter list
 OPENS\$G_VALUE = 0,0,%BPVAL,0 %, ! General value - in next
 position in parameter list

!+
 ! Macros and literals for KEY= keyword and for ISAM
 !-

LITERAL
 OPENS\$K_XAB_SIZE = XAB\$C_KEYLEN + 4;
 MACRO

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```
OPENS8_DTYPE = 0,0,8,0%      ! Key datatype in OPEN list
OPENS1_KEY_LO = 4,0,32,1%     ! Low key position in OPEN list
OPENS1_KEY_HI = 8,0,32,1%     ! High key position in OPEN list
OPENS8_KTYPE = XABSC_KEYLEN,0,8,0% ! Saved datatype
OPENS8_SIZE = XABSC_KEYLEN,8,8,0% ! Saved key size
OPENS8_POS0 = XABSC_KEYLEN,16,16,0% ! Saved low position
```

```
+
! Max. length of ASCII string for FORTRAN OPEN file name array
-
```

```
LITERAL
  OPENS8_STR_MAX = 100; ! Max. length of an ASCII string
                       ! (arg type TZ_R only). No limit
                       ! for string descriptor strings
```

```
+
! Constants used in parameter encoding between the I/O statement routines
! and routine FOR$SIO_BEG. The codes are
! both bit positions in the flag word and an index into
! a table used for sorting out the parameters.
! All are optional for some I/O statement.
-
```

```
LITERAL
  K_UNIT          = 0, ! user supplied unit number
  K_CHAR_COUNT    = 1, ! size of user supplied record for EN/DECODE
  K_REC_NO        = 2, ! user supplied record number
  K_FMT_ADR       = 3, ! user supplied format address
  K_USR_BUF_ADR   = 4, ! user supplied buffer for EN/DECODE
  K_OBJ_TIME_FMT  = 7, ! bit says object time format
```

```
!      End of file FOROPN.REQ
```

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: 0842 0
: 0843 0

REQUIRE 'RTLML:FORPAR';

! Assorted definitions

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R0844 0
R0845 0
R0846 0
R0847 0
R0848 0
R0849 0
R0850 0
R0851 0
R0852 0
R0853 0
R0854 0
R0855 0
R0856 0
R0857 0
R0858 0
R0859 0
R0860 0
R0861 0
R0862 0
R0863 0
R0864 0
R0865 0

Created 15-SEP-1984 22:46:18 by VAX-11 SDL V2.0 Source: 15-SEP-1984 22:45:22 _S255\$DUA28:[FORRTL.SRC]FORP

!*** MODULE \$FORPAR ***
literal FOR\$K_CLASS_SB = 191;
literal FOR\$K_CLASS_NL = 190;
literal FOR\$K_CONTROL_2 = 26;
literal FOR\$K_UNWINDPOP = 0;
literal FOR\$K_UNWINDNOP = 1;
literal FOR\$K_UNWINDRET = 2;
literal FOR\$S_FOR\$R_PAR = 2;
macro FOR\$R_union_1 = 0,0,16,0 %;
literal FOR\$S_union_1 = 2;
macro FOR\$R_structure_1 = 0,0,16,0 %;
literal FOR\$S_structure_1 = 2;
macro FOR\$B_STMT_TYPE = 0,0,8,0 %;
macro FOR\$B_STMT_FLAGS = 1,0,8,0 %;
macro FOR\$R_structure_2 = 0,0,16,0 %;
literal FOR\$S_structure_2 = 2;
macro FOR\$V_OBJ_FMT = 0,8,1,0 %;

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: 0866 0
: 0867 0

REQUIRE 'RTLML:FORRCE';

! RFA Cache Entry structure

R0868 0
 R0869 0
 R0870 0
 R0871 0
 R0872 0
 R0873 0
 R0874 0
 R0875 0
 R0876 0
 R0877 0
 R0878 0
 R0879 0
 R0880 0
 R0881 0
 R0882 0
 R0883 0
 R0884 0
 R0885 0
 R0886 0
 R0887 0
 R0888 0
 R0889 0
 R0890 0
 R0891 0
 R0892 0
 R0893 0
 R0894 0
 R0895 0
 R0896 0
 R0897 0

```
*****
Created 15-SEP-1984 22:46:24 by VAX-11 SDL V2.0      Source: 15-SEP-1984 22:45:34 $255$DUA28:[FORRTL.SRC]FORR
*****

*** MODULE RCEDEF IDENT 1-001 ***
+
An RFA Cache Entry (RCE) contains information about previous records
in the file for use by FOR$BACKSPACE, which implements the FORTRAN
BACKSPACE statement.

For sequential organization and access disk files, each time a new record
is read or written, an entry is added to the RFA cache. The cache itself
is a circularly-linked list, established when the file is opened.

-
Literal RCE_K_CACHE SIZE = 20;          ! Number of entries in cache
Literal RCE_S_RFA UNION = 8;
FIELD RCE_STRUCT$FIELDSET =
SET
  RCE_A_NEXT = [0,0,32,0] .              ! Pointer to next entry
  RCE_A_PREV = [4,0,32,0] .              ! Pointer to previous entry
  RCE_L_LOG_RECNO = [8,0,32,0] .         ! Logical record number for this entry
  RCE_Q_RFA = [12,0,0,0] .               ! RFA for this entry
  RCE_L_RFA0 = [12,0,32,0] .             ! First 4 bytes of RFA
  RCE_W_RFA4 = [16,0,16,0] .             ! Last 2 bytes of RFA
  RCE_R_RFA_STRUCT = [12,0,0,0] .
  RCE_R_RFA_UNION = [12,0,0,0]
TES:
Literal RCE_S_RCE_STRUCT = 20;
MACRO RCE_R_RCE_STRUCT = BLOCK [RCE_S_RCE_STRUCT,byte] FIELD (RCE_STRUCT$FIELDSET) %;
```

: 0898 0
: 0899 0

REQUIRE 'RTLML:OTSISB.BLF';

! Intra-statement block definitions

```

R0900 0
R0901 0
R0902 0
R0903 0
R0904 0
R0905 0
R0906 0
R0907 0
R0908 0
R0909 0
R0910 0
R0911 0
R0912 0
R0913 0
R0914 0
R0915 0
R0916 0
R0917 0
R0918 0
R0919 0
R0920 0
R0921 0
R0922 0
R0923 0
R0924 0
R0925 0
R0926 0
R0927 0
R0928 0
R0929 0
R0930 0
R0931 0
R0932 0
R0933 0
R0934 0
R0935 0
R0936 0
R0937 0
R0938 0
R0939 0
R0940 0
R0941 0
R0942 0
R0943 0
R0944 0
R0945 0
R0946 0
R0947 0
R0948 0
R0949 0
R0950 0
R0951 0
R0952 0
R0953 0
R0954 0
R0955 0
R0956 0

*****
Created 15-SEP-1984 22:48:56 by VAX-11 SDL V2.0 Source: 15-SEP-1984 22:46:55 $255$DUA28:[LIBRTL.SRC]OTSISB.BLF;1
*****

*** MODULE $ISBDEF ***
literal ISBSK-ST-TY-WSF = 1:
literal ISBSK-FORSTTYLO = 1:
literal ISBSK-ST-TY-RSF = 2:
literal ISBSK-ST-TY-WSU = 3:
literal ISBSK-ST-TY-RSU = 4:
literal ISBSK-ST-TY-WDF = 5:
literal ISBSK-ST-TY-RDF = 6:
literal ISBSK-ST-TY-WDU = 7:
literal ISBSK-ST-TY-RDU = 8:
literal ISBSK-ST-TY-WSL = 9:
literal ISBSK-ST-TY-RSL = 10:
literal ISBSK-ST-TY-WMF = 11:
literal ISBSK-MIN-DE-EN = 11:
literal ISBSK-ST-TY-RMF = 12:
literal ISBSK-MAX-DE-EN = 12:
literal ISBSK-ST-TY-QXF = 13:
literal ISBSK-ST-TY-RKF = 14:
literal ISBSK-ST-TY-WXU = 15:
literal ISBSK-ST-TY-RKU = 16:
literal ISBSK-ST-TY-WIF = 17:
literal ISBSK-ST-TY-RIF = 18:
literal ISBSK-ST-TY-WSN = 19:
literal ISBSK-ST-TY-RSN = 20:
literal ISBSK-ST-TY-WIL = 21:
literal ISBSK-ST-TY-RIL = 22:
literal ISBSK-FORSTTYHI = 22:
literal ISBSK-ST-TY-PRI = 27:
literal ISBSK-BASSTTYLO = 27:
literal ISBSK-ST-TY-LIN = 28:
literal ISBSK-ST-TY-PSE = 29:
literal ISBSK-ST-TY-INP = 30:
literal ISBSK-ST-TY-PRU = 31:
literal ISBSK-ST-TY-INL = 32:
literal ISBSK-ST-TY-DEL = 33:
literal ISBSK-ST-TY-REA = 34:
literal ISBSK-ST-TY-UPD = 35:
literal ISBSK-ST-TY-GSE = 36:
literal ISBSK-ST-TY-RES = 37:
literal ISBSK-ST-TY-SCR = 38:
literal ISBSK-ST-TY-PRE = 39:
literal ISBSK-ST-TY-GRE = 40:
literal ISBSK-ST-TY-FRE = 41:
literal ISBSK-ST-TY-UNL = 42:
literal ISBSK-ST-TY-FEE = 43:
literal ISBSK-ST-TY-GIN = 44:
literal ISBSK-ST-TY-PIN = 45:
literal ISBSK-ST-TY-MOV = 46:
literal ISBSK-ST-TY-FIN = 47:
literal ISBSK-ST-TY-MIN = 48:
literal ISBSK-ST-TY-RIN = 49:
literal ISBSK-ST-TY-MLI = 50:

```

```
R0957 0 literal ISBSK-ST-TY-FSE = 51;
R0958 0 literal ISBSK-ST-TY-MPR = 53;
R0959 0 literal ISBSK-ST-TY-MRE = 54;
R0960 0 literal ISBSK-ST-TY-GRFA = 55;
R0961 0 literal ISBSK-ST-TY-FRFA = 56;
R0962 0 literal ISBSK-BASSTTYHI = 56;
R0963 0 literal ISBSK-NEG_LUB = -100;
R0964 0 literal ISBSK-ISR_LEN = 188;
R0965 0 literal ISBSK-union_1B = 16;
R0966 0 literal ISBSK-union_2 = 16;
R0967 0 literal ISBSK-lub filler = 100;
R0968 0 FIELD ISBSKIECDSET =
R0969 0 SET
R0970 0 ISBSA_RESTARTPC = [-188.0.32.0] ;
R0971 0 ISBSA_USR_HANDL = [-188.0.32.0] ;
R0972 0 ISBSr_union_1 = [-188.0.32.0] ;
R0973 0 ISBSA_MAJ_F_PTR = [-184.0.32.0] ;
R0974 0 ISBSA_PREVIOUS_LUB = [-184.0.32.0] .
R0975 0 ISBSr_union_1A = [-184.0.32.0] ;
R0976 0 ISBSA_USER_FP = [-180.0.32.0] ;
R0977 0 ISBSW_FMT_STKP = [-176.0.0.0] ;
R0978 0 ISBSA_SAVE_PTR = [-176.0.32.0] ;
R0979 0 ISBSA_SAVE_END = [-172.0.32.0] ;
R0980 0 ISBSr_structure_1B = [-176.0.0.0] .
R0981 0 ISBSr_union_1B = [-176.0.0.0] ;
R0982 0 ISBSW_FMT_STKR = [-160.0.0.0] ;
R0983 0 ISBSB_SCA_FAC_D = [-160.0.0.0] .
R0984 0 ISBSr_union_2 = [-160.0.0.0] ;
R0985 0 ISBSB_ERR_NO = [-144.0.8.0] ;
R0986 0 ISBSB_SCAE_FAC = [-144.0.8.1] .
R0987 0 ISBSr_union_3 = [-144.0.8.0] ;
R0988 0 ISBSB_STIM_TYPE = [-143.0.8.0] .
R0989 0 ISBSW_FMT_LEN = [-142.0.16.0] ;
R0990 0 ISBSA_ERR_EQUAL = [-140.0.32.0] ;
R0991 0 ISBSA_END_EQUAL = [-136.0.32.0] ;
R0992 0 ISBSA_FMT_BEG = [-132.0.32.0] ;
R0993 0 ISBSA_FMT_PTR = [-128.0.32.0] ;
R0994 0 ISBSL_LIS_HEAP_LEN = [-128.0.32.0] .
R0995 0 ISBSr_union_3A = [-128.0.32.0] ;
R0996 0 ISBSA_LIS_STR = [-124.0.32.0] ;
R0997 0 ISBSB_FMT_P = [-120.0.8.1] ;
R0998 0 ISBSW_FMT_W = [-119.0.16.0] ;
R0999 0 ISBSB_FMT_D = [-117.0.8.0] ;
R1000 0 ISBSB_FMT_E = [-116.0.8.0] ;
R1001 0 ISBSW_FMT_REP = [-115.0.16.1] ;
R1002 0 ISBSW_LIS_REP = [-115.0.16.0] ;
R1003 0 ISBSW_LEN_REM = [-115.0.16.0] ;
R1004 0 ISBSr_union_4 = [-115.0.16.0] ;
R1005 0 ISBSB_FMT_CODE = [-113.0.8.0] ;
R1006 0 ISBSV_FMT_REPRE = [-113.0.1.0] ;
R1007 0 ISBSR_FMT_CODE_STRUCT = [-113.0.8.0] .
R1008 0 ISBSR_FMT_CODE_UNION = [-113.0.8.0] .
R1009 0 ISBSB_LIS_CTYPE = [-113.0.8.0] ;
R1010 0 ISBSr_union_5 = [-113.0.8.0] ;
R1011 0 ISBSW_FMT_REVER = [-112.0.16.0] ;
R1012 0 ISBSB_FMT_DEP = [-110.0.8.0] ;
R1013 0 ISBSW_FMT_FLAGS = [-109.0.16.0] .
```



```

R1014 0      ISBSB_INP_FLAGS = [-109.0.8.0] .
R1015 00     ISBSV_BN = [-109.0.1.0] .
R1016 00     ISBSV_ONLY_E = [-109.1.1.0] .
R1017 00     ISBSV_ERR_OFLO = [-109.2.1.0] .
R1018 00     ISBSV_DONTROUND = [-109.3.1.0] .
R1019 00     ISBSV_SKIPTABS = [-109.4.1.0] .
R1020 00     ISBSV_EXP_LETTER = [-109.5.1.0] .
R1021 00     ISBSV_FORCESCALE = [-109.6.1.0] .
R1022 00     ISBSR_INP_FLAGS_STRUCT = [-109.0.8.0] .
R1023 00     ISBSR_INP_FLAGS_UNION = [-109.0.8.0] .
R1024 00     ISBSB_OUT_FLAGS = [-108.0.8.0] .
R1025 00     ISBSV_SP = [-108.0.1.0] .
R1026 00     ISBSV_ERR_OFLO = [-108.1.1.0] .
R1027 00     ISBSR_OUT_FLAGS_STRUCT = [-108.0.8.0] .
R1028 00     ISBSR_OUT_FLAGS_UNION = [-108.0.8.0] .
R1029 00     ISBSR_FMT_FLAGS_STRUCT = [-109.0.16.0] .
R1030 00     ISBSR_FMT_FLAGS_UNION = [-109.0.16.0] .
R1031 00     ISBSW_STTM_STAT = [-106.0.16.0] .
R1032 00     ISBSV_P_FORM_CH = [-106.0.2.0] .
R1033 00     ISBSV_DOLLAR = [-106.2.1.0] .
R1034 00     ISBSV_USER_ELEM = [-106.3.1.0] .
R1035 00     ISBSV_SLASH = [-106.4.1.0] .
R1036 00     ISBSV_LAST_REC = [-106.5.1.0] .
R1037 00     ISBSV_DE_ENCODE = [-106.6.1.0] .
R1038 00     ISBSV_LIS_HEAP = [-106.7.1.0] .
R1039 00     ISBSV_RECURSIVE = [-106.8.1.0] .
R1040 00     ISBSV_MAT_CONT = [-106.9.1.0] .
R1041 00     ISBSV_MAT_PRINT = [-106.10.1.0] .
R1042 00     ISBSV_PRINT_INI = [-106.11.1.0] .
R1043 00     ISBSV_SINGL_ELEM = [-106.12.1.0] .
R1044 00     ISBSV_NEED_INIT = [-106.13.1.0] .
R1045 00     ISBSR_STTM_STAT_STRUCTURE = [-106.0.16.0] .
R1046 00     ISBSR_STTM_STAT_UNION = [-106.0.16.0] .
R1047 00     ISBSA_INTFILEND = [-104.0.32.0] .
R1048 00     TES:
R1049 00     Literal ISB$$ ISB = 189;
R1050 00     MACRO ISB = BLOCK [ISB$$_ISB,byte] FIELD (ISB$FIELDSET) %;

```

F 12
15-Sep-1984 23:44:38
15-Sep-1984 22:44:59

VAX-11 Bliss-32 V4.0-742
_S255\$DUA28:[FORRTL.SRC]FORLIB.REQ;1 Page 32 (1)

1051 0 UNDECLARE %QUOTE ISB;
1052 0
1053 0 REQUIRE 'RTLML:OTSLUB.BLF';

! Logical Unit Block definitions

R1054 0
R1055 0
R1056 0
R1057 0
R1058 0
R1059 0
R1060 0
R1061 0
R1062 0
R1063 0
R1064 0
R1065 0
R1066 0
R1067 0
R1068 0
R1069 0
R1070 0
R1071 0
R1072 0
R1073 0
R1074 0
R1075 0
R1076 0
R1077 0
R1078 0
R1079 0
R1080 0
R1081 0
R1082 0
R1083 0
R1084 0
R1085 0
R1086 0
R1087 0
R1088 0
R1089 0
R1090 0
R1091 0
R1092 0
R1093 0
R1094 0
R1095 0
R1096 0
R1097 0
R1098 0
R1099 0
R1100 0
R1101 0
R1102 0
R1103 0
R1104 0
R1105 0
R1106 0
R1107 0
R1108 0
R1109 0
R1110 0

```

*****
Created 15-SEP-1984 22:49:15 by VAX-11 SDL V2.0 Source: 15-SEP-1984 22:47:02 _S255SDUA28:[LIBRTL.SRC]OTSL
*****

*** MODULE $LUBDEF ***
literal LUBSK_ORG_SEQUE = 1;
literal LUBSK_ORG_RELAT = 2;
literal LUBSK_ORG_INDEX = 3;
literal LUBSK_ORG_TERMI = 4;
literal LUBSK_ORG_VIRTU = 5;
literal LUBSK_LUN_BPRI = -8;
literal LUBSK_LUN_INPU = -7;
literal LUBSK_LUN_BREAD = -6;
literal LUBSK_LUN_ENCD = -5;
literal LUBSK_LUN_READ = -4;
literal LUBSK_LUN_ACCE = -3;
literal LUBSK_LUN_TYPE = -2;
literal LUBSK_LUN_PRIN = -1;
literal LUBSK_ILUN_MIN = -8;
literal LUBSK_DLUN_MIN = -4;
literal LUBSK_DLUN_MAX = -1;
literal LUBSK_LUN_MIN = 0;
literal LUBSK_LUN_MAX = 119;
literal LUBSK_D_MARGIN = 72;
literal LUBSK_PBUF_SIZ = 80;
literal LUBSK_NEG_BLN = -100;
literal LUBSK_LANG_MIN = 0;
literal LUBSK_LANG_NONE = 0;
literal LUBSK_LANG_BAS = 1;
literal LUBSK_LANG_FOR = 2;
literal LUBSK_LANG_MAX = 2;
literal LUBSK_LUB_LEN = 100;
literal LUBSS_QUEUE = 8;
literal LUBSS_DID = 6;
FIELD LUBSFIECDSET =
SET
LUB$A_UBF = [-100,0,32,0] .
LUB$W_UNIT_STT3 = [-96,0,16,0] .
LUB$V_NOECHO = [-96,0,1,0] .
LUB$V_ONECHR = [-96,1,1,0] .
LUB$V_CCO = [-96,2,1,0] .
LUB$V_FIND_LAST = [-96,3,1,0] .
LUB$V_PTA = [-96,4,1,0] .
LUB$V_AST_GUARD = [-96,5,1,0] .
LUB$V_CR = [-96,6,1,0] .
LUB$V_FTN = [-96,7,1,0] .
LUB$V_PRN = [-96,8,1,0] .
LUB$V_NOMARGIN = [-96,9,1,0] .
LUB$V_USEROPEN = [-96,10,1,0] .
LUB$V_NOTSEQORG = [-96,11,1,0] .
LUB$V_ANSI = [-96,12,1,0] .
LUB$V_RFA_CACHE_ENABLE = [-96,13,1,0] .
LUB$V_FIECD_USE = [-96,14,1,0] .
LUB$R_UNIT_STT3_STRUCT = [-96,0,16,0] .
LUB$r_union_T = [-96,0,16,0] .
LUB$W_BLS = [-94,0,16,0] .

```

H 12
15-Sep-1984 23:44:38
15-Sep-1984 23:02:25

VAX-11 Bliss-32 V4.0-742 Page 34
_S255SDUA28:[FORRTL.OBJ]OTSLUB.BLF;1 (1)

```
R1111 0 LUBSA_CLOSE = [-92.0,32.0] .
R1112 0 LUBSQ_QUEUE = [-88.0,0.0] .
R1113 0 LUBSA_BUF_PTR = [-80.0,32.0] .
R1114 0 LUBSA_BUF_END = [-76.0,32.0] .
R1115 0 LUBSA_BUDDY_PTR = [-72.0,32.0] .
R1116 0 LUBSA_BUF_BEG = [-68.0,32.0] .
R1117 0 LUBSA_BUF_HIGH = [-64.0,32.0] .
R1118 0 LUBSB_ORGAN = [-60.0,8.0] .
R1119 0 LUBSB_BKS = [-59.0,8.0] .
R1120 0 LUBSW_LUN = [-58.0,16.0] .
R1121 0 LUBSL_PRINT_POS = [-56.0,32.0] .
R1122 0 LUBSA_RFA_CACHE_BEG = [-56.0,32.0] .
R1123 0 LUBSR_union_1A = [-56.0,32.0] .
R1124 0 LUBSL_WAIT_TIME = [-52.0,32.0] .
R1125 0 LUBSA_RFA_CACHE_PTR = [-52.0,32.0] .
R1126 0 LUBSR_union_1B = [-52.0,32.0] .
R1127 0 LUBSW_IFI = [-48.0,16.0] .
R1128 0 LUBSW_RBUF_SIZE = [-46.0,16.0] .
R1129 0 LUBSW_R_MARGIN = [-44.0,16.0] .
R1130 0 LUBSW_D_MARGIN = [-42.0,16.0] .
R1131 0 LUBSB_LANGUAGE = [-40.0,8.0] .
R1132 0 LUBSB_RFM = [-39.0,8.0] .
R1133 0 LUBSW_BAS_VFC = [-38.0,16.0] .
R1134 0 LUBSB_BAS_VFC1 = [-38.0,8.0] .
R1135 0 LUBSB_BAS_VFC2 = [-37.0,8.0] .
R1136 0 LUBSR_BAS_VFC_STRUCT = [-38.0,16.0] .
R1137 0 LUBSR_union_2 = [-38.0,16.0] .
R1138 0 LUBSA_ASSOC_VAR = [-36.0,32.0] .
R1139 0 LUBSL_ALQ = [-36.0,32.0] .
R1140 0 LUBSR_union_3 = [-36.0,32.0] .
R1141 0 LUBSL_LOG_RECNO = [-32.0,32.0] .
R1142 0 LUBSL_REC_MAX = [-28.0,32.0] .
R1143 0 LUBSA_FAB = [-24.0,32.0] .
R1144 0 LUBSA_RBUF_ADR = [-20.0,32.0] .
R1145 0 LUBSW_DID = [-16.0,0.0] .
R1146 0 LUBSB_RAT = [-10.0,8.0] .
R1147 0 LUBSB_RSL = [-9.0,8.0] .
R1148 0 LUBSA_RSN = [-8.0,32.0] .
R1149 0 LUBSW_UNIT_ATTR = [-4.0,16.0] .
R1150 0 LUBSV_OPENED = [-4.0,1.0] .
R1151 0 LUBSV_IO_ACTIVE = [-4.1,1.0] .
R1152 0 LUBSV_READ_ONLY = [-4.2,1.0] .
R1153 0 LUBSV_OLD_FILE = [-4.3,1.0] .
R1154 0 LUBSV_DIRECT = [-4.4,1.0] .
R1155 0 LUBSV_SCRATCH = [-4.5,1.0] .
R1156 0 LUBSV_DELETE = [-4.6,1.0] .
R1157 0 LUBSV_PRINT = [-4.7,1.0] .
R1158 0 LUBSV_FORMATTED = [-4.8,1.0] .
R1159 0 LUBSV_UNFORMAT = [-4.9,1.0] .
R1160 0 LUBSV_FIXED = [-4.10,1.0] .
R1161 0 LUBSV_SEGMENTED = [-4.11,1.0] .
R1162 0 LUBSV_ASS_VAR_L = [-4.12,1.0] .
R1163 0 LUBSV_APPEND = [-4.13,1.0] .
R1164 0 LUBSV_SEQUENTIAL = [-4.14,1.0] .
R1165 0 LUBSV_KEYED = [-4.15,1.0] .
R1166 0 LUBSR_UNIT_ATTR_STRUCT = [-4.0,16.0] .
R1167 0 LUBSR_union_4 = [-4.0,16.0] .
```


1 12
15-Sep-1984 23:44:38
15-Sep-1984 23:02:25

VAX-11 Bliss-32 V4.0-742
_S255\$DUA28:[FORRTL.OBJ]OTSLUB.BLF;1 Page 35
(1)

```
... R1168 0 LUB$W_UNIT_STT2 = [-2,0,16,0] ;
... R1169 0 LUB$V_VIRT_RSN = [-2,0,1,0] ;
... R1170 0 LUB$V_ENDFILEOPN = [-2,1,1,0] ;
... R1171 0 LUB$V_FORM_CHAR = [-2,2,1,0] ;
... R1172 0 LUB$V_OUTBUF_DR = [-2,3,1,0] ;
... R1173 0 LUB$V_TERM_FOR = [-2,4,1,0] ;
... R1174 0 LUB$V_TERM_DEV = [-2,5,1,0] ;
... R1175 0 LUB$V_FORCTBLE = [-2,6,1,0] ;
... R1176 0 LUB$V_UNIT_0 = [-2,7,1,0] ;
... R1177 0 LUB$V_VA_USE = [-2,8,1,0] ;
... R1178 0 LUB$V_BLK_USE = [-2,9,1,0] ;
... R1179 0 LUB$V_M_STREAM = [-2,10,1,0] ;
... R1180 0 LUB$V_M_STR_C = [-2,11,1,0] ;
... R1181 0 LUB$V_DEALLOC = [-2,12,1,0] ;
... R1182 0 LUB$V_SUBMIT = [-2,13,1,0] ;
... R1183 0 LUB$V_NULLBLNK = [-2,14,1,0] ;
... R1184 0 LUB$V_USER_RBUF = [-2,15,1,0] ;
... R1185 0 LUB$R_UNIT_STT2_STRUCT = [-2,0,16,0] ;
... R1186 0 LUB$r_union_5 = [-2,0,16,0] ;
... R1187 0 TES;
... R1188 0 literal LUB$$LUB = 101;
... R1189 0 MACRO LUB = BLOCK [LUB$$LUB,byte] FIELD (LUB$FIELDSET) %;
```

J 12
15-Sep-1984 23:44:38
15-Sep-1984 22:44:59

VAX-11 Bliss-32 V4.0-742
_S255\$DUA28:[FORRTL.SRC]FORLIB.REQ;1 Page 36
(1)

```
1190 0 UNDECLARE %QUOTE LUB;
1191 0
1192 0
1193 0
1194 0
1195 0
1196 0
1197 0
1198 0
1199 0
1200 0

!+ Define macro that declares the CCB structure. Note that it has no
!- allocation size - it must be used in a REF declaration.

MACRO
  $FOR$CCB_DECL = BLOCK [, BYTE] FIELD (LUB$FIELDSET, ISB$FIELDSET) %;
  REQUIRE 'RTLIN:OTSCCBREQ';           ! OTS CCB data structure definitions
```

* This file, OTSCCBREQ.REQ, defines the interface to OTSPUSH_CCB Edit: SBL1006

*
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Revision History:

- 1-001 - Original. JBS 09-JAN-1979
- 1-002 - Change name to OTSCCBREQ.REQ so as not to conflict at system
build time with OTSCCB.B32. SBL 10-May-1979
- 1-003 - Add the definition of the structure for OTS\$AA_LUB_TAB.
JBS 28-JUN-1979
- 1-004 - Add the definition of the field for OTS\$V_LUN_OWNR.
JBS 16-AUG-1979
- 1-005 - Remove PRINT statement, for the new BLISS compiler.
JBS 02-OCT-1979
- 1-006 - Add new structure OTS\$LUN_OWNR_ST used for OTS\$V_LUN_OWNR. This
helps BLISS generate smaller code for references to this structure.

* Define the return codes from OTSPUSH_CCB.

LITERAL

| | |
|-----------------------|--|
| OTS\$K_PUSH_MIN = 1, | ! Smallest valid value |
| OTS\$K_PUSH_OK = 1, | ! CCB loaded, I/O not active |
| OTS\$K_PUSH_ACT = 2, | ! CCB loaded, I/O active on this LUN |
| OTS\$K_PUSH_FAIL = 3, | ! CCB not loaded, out of virtual storage |
| OTS\$K_PUSH_MAX = 3; | ! Largest valid value |

* The following structure is used for addressing OTS\$AA_LUB_TAB.

R1258 0
R1259 0
R1260 0
R1261 0
R1262 0
R1263 0
R1264 0
R1265 0
R1266 0
R1267 0
R1268 0
R1269 0
R1270 0
R1271 0
R1272 0
R1273 0
R1274 0
R1275 0
R1276 0
R1277 0
R1278 0
R1279 0
R1280 0
R1281 0
R1282 0
R1283 0
R1284 0
R1285 0
R1286 0
R1287 0
R1288 0
R1289 0
R1290 0
R1291 0
R1292 0
R1293 0
R1294 0
R1295 0
R1296 0
R1297 0

It is similar to VECTOR, but offsets the index so that certain negative logical unit numbers can be used, and each element is a quadword so as to act as a queue header.

STRUCTURE
OTSS\$LUB_TAB_ST [I, SIDE; N, LB, UNIT = 4, EXT = 0] =
[N*UNIT*2]
(OTSS\$LUB_TAB_ST + ((SIDE + ((I - LB)*2))*UNIT))<0, 8*UNIT, EXT>;

↑
The following structure is similar to BLOCKVECTOR, but allows a low and high bound.

STRUCTURE
OTSS\$LUN_OWNR_ST [I, O, P, S, E; L, H, BS, UNIT=1] =
[((H - L) + 1) * BS * UNIT]
(OTSS\$LUN_OWNR_ST + (O - L) + ((O + I) * BS * UNIT))<P, S, E>;

↑
The following field is used to refer to OTSS\$V_LUN_OWNR, which has a bit for each LUB, each block containing a bit for each language.

FIELD
OTSS\$V_OWNR_FLD =
SET
OTSS\$V_OWNR_BAS = [0, LUB\$K_LANG_BAS, 1, 0], ! BASIC
OTSS\$V_OWNR_FOR = [0, LUB\$K_LANG_FOR, 1, 0], ! FORTRAN
OTSS\$V_OWNR = [0, LUB\$K_LANG_MIN, (((LUB\$K_LANG_MAX-LUB\$K_LANG_MIN)*%BPUNIT)/%BPUNIT)*%BPUNIT, 0]
TES;

↑
The following masks are used to test OTSS\$V_OWNR to be sure that only one bit is set.

LITERAL
OTSS\$M_OWNR_BAS = 1 ^ LUB\$K_LANG_BAS,
OTSS\$M_OWNR_FOR = 1 ^ LUB\$K_LANG_FOR;

! End of file OTSCCBREQ.REQ

1298 0
1299 0
1300 0
REQUIRE 'RTLIN:OTSLNK';

! (Must come after OTSISB and OTSLUB)
! Common Linkage definitions

File: OTSLNK.REQ Edit: PLL1035

+ This file, OTSLNK.REQ, contains the definitions of all LINKAGE declarations
for BLISS modules

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Author: T. Hastings

- 1-11 - Add CALL R0. TNH 29-July-78
- 1-12 - Add JSB_CB_GET. TNH 2-Aug-78
- 1-13 - Change name to FORLNK.REQ. JBS 14-NOV-78
- 1-014 - Add copyright notice. JBS 16-NOV-78
- 1-015 - Change file name to OTSLNK.REQ. JBS 06-DEC-78
- 1-016 - Add linkage for BMF (Basic major frame ptr) - R11. DGP 17-Dec-78
- 1-017 - Fix some comments. JBS 18-DEC-78
- 1-018 - Change JSB_REC0 linkage to save registers needed for CH\$FILL. DGP
27-Feb-79
- 1-019 - Similarly, change JSB_UDF0, since the UDF routines must
preserve the same registers to call the REC routines.
JBS 28-FEB-1979
- 1-020 - That change causes a similar change in JBS_REC1 and JSB_REC9.
JBS 28-FEB-1979
- 1-021 - Which in turn causes the same changes in JSB_UDF9.
JBS 28-FEB-1979
- 1-022 - Which in turn causes the same changes in JBS_DO_READ and
JSB_DO_WRITE. JBS 28-FEB-1979
- 1-023 - Add linkage JSB_CCB_A1 A0 for PUT relative with count. DGP 02-Mar-79
- 1-024 - Add linkage JSB_REC_IND for indexed file support. DGP 03-Apr-79
- 1-025 - Change linkage JSB_REC_IND to take 5 args. DGP 06-Apr-79
- 1-026 - Add linkage for conversion kernel routine. DGP 27-Jun-79
- 1-028 - Add linkage for Basic format routines. DGP 30-Jul-79
- 1-029 - Remove PRINT statement, for new BLISS compiler. JBS 02-OCT-1979
- 1-030 - Change JSB_FORMAT A7 to A10. DGP 31-Oct-79
- 1-031 - Add new linkage JSB_REC_WSL1. DGP 06-Nov-79

1-032 - Change JSB_UDFO, JSB_FMT0 so that they pass no arguments. SBL 5-Dec-1979
1-033 - Add linkage JSB_FMT1 for Fortran format interpreter. JAW
08-Aug-1981
1-034 - Change JSB_A5_R11 to JSB_A6_R11, JSB_A10_R11 to JSB_A11_R11.
PLL 16-Mar-1982
1-035 - Change JSB_DO_READ, JSB_REC_IND, JSB_REC0. PLL 1-Jun-1982

++
Linkage definitions for BLISS modules for CALL and JSB routines
The idea is to have all definitions here in one place
so that they can be changed easily and the entire
RIL recompiled.
--

+
Define symbols for register numbers used to pass parameters from one
module to another. Note: these symbols are used in the modules in
GLOBAL REGISTER declarations rather than below in this REQUIRE file
(where all registers appear as absolute numbers).
--

LITERAL

K_BMF_REG = 11, ! Register used by Basic compiler to point
! to last major frame
K_CCB_REG = 11; ! Pointer to LUB/ISB/RAB

+
First define some macros for frequently used combinations.
Do not change the PRESERVE conventions for our sanity.
Also do not change the definitions of these combination, since
they are also used in defining local routines within a module that is CALLED!!!
NOTE: Local routines which are JSBed to from JSB procedures must
have LINKAGE definitions here even though only local procedures.
Otherwise, lose control of NOTUSED registers which must be same
or more inclusive for JSB routines called by JSB routines.
See DO_READ and DO_WRITE for examples.
--

MACRO

!+
CALL interface with CCB passed in R11 (in and/or out)
--

CALL_CCB_R11 =
CALL: GLOBAL(CCB=11) %.

!+
JSB interface with CCB passed in R11, 1 arg in R0 and 1 arg in R1 and
only uses R0 and R1
--

JSB_CCB_A1_A0 =
JSB (REGISTER = 1, REGISTER = 0): GLOBAL(CCB=11) NOTUSED(2,3,4,5,6,7,8,9,10) %.

!+
--

R1415 0
R1416 0
R1417 0
MR1418 0
R1419 0
R1420 0
R1421 0
R1422 0
R1423 0
R1424 0
R1425 0
MR1426 0
R1427 0
R1428 0
R1429 0
R1430 0
R1431 0
R1432 0
MR1433 0
R1434 0
R1435 0
R1436 0
R1437 0
R1438 0
R1439 0
MR1440 0
R1441 0
R1442 0
R1443 0
R1444 0
R1445 0
R1446 0
MR1447 0
R1448 0
R1449 0
R1450 0
R1451 0
R1452 0
R1453 0
R1454 0
MR1455 0
R1456 0
R1457 0
R1458 0
R1459 0
R1460 0
R1461 0
MR1462 0
R1463 0
R1464 0
R1465 0
R1466 0
R1467 0
R1468 0
R1469 0
R1470 0
MR1471 0

```

| CALL interface with BMF passed in R11 (in and/or out)
|-
CALL_BMF_R11 =
    CALL: GLOBAL(BMF=11) %,

|+
| CALL interface with 1st arg in R0
|-
CALL_A0 =
    CALL (REGISTER = 0): %,

|+
| JSB interface with CCB passed in R11, no args and uses R0-R5
|-
JSB_CCB_R5 =
    JSB: GLOBAL(CCB=11) NOTUSED (6,7,8,9,10) %,

|+
| JSB interface with CCB passed in R11, no args and only uses R0, R1
|-
JSB_CCB_NO_ARGS =
    JSB: GLOBAL(CCB=11) NOTUSED (2,3,4,5,6,7,8,9,10) %,

|+
| JSB interface with CCB passed in R11, 1 arg in R0, and only uses R0, R1
|-
JSB_CCB_A0 =
    JSB (REGISTER = 0): GLOBAL(CCB=11) NOTUSED (2,3,4,5,6,7,8,9,10) %,

|+
| JSB interface with CCB passed in R11, 1 arg in R0, and preserves
| through R5. Needed for MOVCS or calling routines that use MOVCS.
|-
JSB_CCB_A0_R5 =
    JSB (REGISTER = 0): GLOBAL(CCB=11) NOTUSED (6,7,8,9,10) %,

|+
| Same as above, but with 2 arguments.
|-
JSB_CCB_A1_R5 =
    JSB (REGISTER = 0, REGISTER = 1): GLOBAL(CCB=11) NOTUSED (6,7,8,9,10) %,

|+
| JSB interface with CCB passed in R11, 1 arg in R2, and only uses R0, R1, R2
| Needed when input arg is referenced after a CALL or JSB,
| so do not need to copy to R2.
|-
JSB_CCB_A2 =

```


R1472 0
R1473 0
R1474 0
R1475 0
R1476 0
R1477 0
R1478 0
R1479 0
MR1480 0
R1481 0
R1482 0
R1483 0
R1484 0
R1485 0
R1486 0
R1487 0
R1488 0
MR1489 0
MR1490 0
R1491 0
R1492 0
R1493 0
R1494 0
R1495 0
R1496 0
R1497 0
MR1498 0
MR1499 0
R1500 0
R1501 0
MR1502 0
MR1503 0
R1504 0
R1505 0
R1506 0
R1507 0
R1508 0
R1509 0
R1510 0
R1511 0
R1512 0
MR1513 0
R1514 0
R1515 0
R1516 0
R1517 0
R1518 0
R1519 0
MR1520 0
R1521 0
R1522 0
P1523 0
R1524 0
R1525 0
R1526 0
R1527 0
R1528 0

JSB (REGISTER = 2): GLOBAL(CCB=11) NOTUSED (3,4,5,6,7,8,9,10) %.

+ JSB interface with CCB passed in R11, 1 arg in R2, and preserves
through R5. Needed in place of JBS_CCB_A2 to do MOVCS, or call
routines which do.
-

JSB_CCB_A2 R5 =
JSB (REGISTER = 2): GLOBAL(CCB=11) NOTUSED (6,7,8,9,10) %.

+ JSB interface for Fortran format interpreter with CCB passed in
R11, two arguments passed in R10 and P9, and routine value
returned in R8.
-

JSB_CCB_FMT1 =
JSB: GLOBAL(CCB = 11, EL SIZE = 10, DT SEEN = 9, FMT_CODE = 8)
NOPRESERVE (2,3) NOTUSED (4,5,6,7) %.

+ Support for Indexed files.
Pass arguments (6) in R0:R5 and CCB is passed in R11.
-

JSB_CCB_A6 R5 =
JSB (REGISTER = 0, REGISTER = 1, REGISTER = 2, REGISTER = 3,
REGISTER = 4, REGISTER = 5): GLOBAL (CCB = 11) NOTUSED (6, 7, 8, 9, 10) %.

JSB_CCB_A5 R5 =
JSB (REGISTER = 0, REGISTER = 1, REGISTER = 2, REGISTER = 3,
REGISTER = 4): GLOBAL (CCB = 11) NOTUSED (6, 7, 8, 9, 10) %.

+ JSB interface with CCB passed in R11, arg1 in R2, arg2 in R0,
and only uses R0, R1, R2.
Needed when input arg1 is referenced after a CALL or JSB, so save
copying to R2.
-

JSB_CCB_A2 A0 =
JSB (REGISTER = 2, REGISTER = 0): GLOBAL(CCB=11) NOTUSED (3,4,5,6,7,8,9,10) %.

+ JSB interface (no CCB), args in R0 and R9
-

JSB_A0 A1 R8 =
JSB (REGISTER = 0, REGISTER = 1) : NOPRESERVE (2,3,4,5,6,7,8) %.

+ JSB for Basic format routines - Plain F and E format. Pass
6 args and preserve all other registers. (1 optional arg)
-

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MR1529 0
MR1530 0
R1531 0
R1532 0
R1533 0
R1534 0
R1535 0
R1536 0
R1537 0
MR1538 0
MR1539 0
MR1540 0
R1541 0
R1542 0
R1543 0
R1544 0
R1545 0
R1546 0
MR1547 0
R1548 0
R1549 0

JSB_A6 R11 =
-JSB (REGISTER = 0, REGISTER = 1, REGISTER = 2, REGISTER = 3, REGISTER = 4, REGISTER = 5) :
PRESERVE (6, 7, 8, 9, 10, 11) %;

+
JSB for Basic format routines - Fancy F and E formats. Pass 11 args and
preserve all other registers. (4 optional args)
-

JSB_A11_R11 =
-JSB (REGISTER = 0, REGISTER = 1, REGISTER = 2, REGISTER = 3, REGISTER = 4,
REGISTER = 5, REGISTER = 6, REGISTER = 7, REGISTER = 8, REGISTER = 9, REGISTER = 10) :
PRESERVE (11) %;

+
JSB interface (without CCB), no args in registers
-

JSB_NO_ARGS =
-JSB: NOTUSED (2,3,4,5,6,7,8,9,10) %;

R1550 0
R1551 0
R1552 0
R1553 0
R1554 0
R1555 0
R1556 0
R1557 0
R1558 0
R1559 0
R1560 0
R1561 0
R1562 0
R1563 0
R1564 0
R1565 0
R1566 0
R1567 0
R1568 0
R1569 0
R1570 0
R1571 0
R1572 0
R1573 0
R1574 0
R1575 0
R1576 0
R1577 0
R1578 0
R1579 0
R1580 0
R1581 0
R1582 0
R1583 0
R1584 0
R1585 0
R1586 0
R1587 0
R1588 0
R1589 0
R1590 0
R1591 0
R1592 0
R1593 0
R1594 0
R1595 0
R1596 0
R1597 0
R1598 0
R1599 0
R1600 0
R1601 0
R1602 0
R1603 0
R1604 0
R1605 0
R1606 0

++
Now define the LINKAGE declarations.
Use names associated with the entry point rather than
the type of linkage, so that we can easily change
the linkage for an entry point without changing that
for other entry points.
Note: entry points that are dispatched to using a table
must have the same linkage name. In this case the LINKAGE
name is associated with the name of the dispatch table and
the call is made using the general LINKAGE form.

NOTUSED restriction!!! Because each JSB declaration must be
aware of all JSB routines which are in turn called. The NOTUSED
registers can only be the same as the caller (if also a JSB routine)
or include additional registers as well as being the same.
Thus, this file documents the calling tree for JSB linkages
so that the NOTUSED declarations can be kept in agreement.
--

LINKAGE

++
Default CALL using CCB as a GLOBAL register,
all args in arg list.
--

CALL_CCB = CALL_CCB_R11,

++
CALL from BASIC compiled code, which uses R11 to point to the
major frame.
--

CALL_BMF = CALL_BMF_R11,

++
This is a linkage for BAS\$\$REC_WSL1 to allow one arg to be passed.
--

JSB_REC_WSL1 = JSB_CCB_A0_R5,

++
CALL passing first arg in R0.
Used by FORENTRY module to make multiple entry points
all branch to FIOBEG.
--

CALL_FIOBEG = CALL_A0,

++
UDF initialization (user data formatting level of abstraction)
Arg is adr. of format statement.
JSBs to record level initialization (JSB_RECO).
--

JSB_UDFO = JSB_CCB_R5,

++

```

R1607 0 | JSB to plain formatting routines for Basic.
R1608 0 |
R1609 0 |
R1610 0 JSB_FORMAT_A6 = JSB_A6_R11,
R1611 0 |
R1612 0 |
R1613 0 |
R1614 0 | JSB to fancy formatting routines for Basic.
R1615 0 |
R1616 0 JSB_FORMAT_A11 = JSB_A11_R11,
R1617 0 |
R1618 0 |
R1619 0 |
R1620 0 | UDF termination (user data formatting level of abstraction)
R1621 0 | JSBs to DO_READ (JSB_DO_READ) or DO_WRITE (JSB_DO_WRITE).
R1622 0 |
R1623 0 JSB_UDF9 = JSB_CCB_R5,
R1624 0 |
R1625 0 |
R1626 0 | UDF read routine
R1627 0 | JSBs to record level (JSB_REC1).
R1628 0 |
R1629 0 |
R1630 0 JSB_DO_READ = JSB_CCB_A1_R5,
R1631 0 |
R1632 0 |
R1633 0 | UDF write routine
R1634 0 | JSBs to record level (JSB_REC1).
R1635 0 |
R1636 0 |
R1637 0 JSB_DO_WRITE = JSB_CCB_A0_R5,
R1638 0 |
R1639 0 |
R1640 0 |
R1641 0 | Format interpreter initialization: FORMAT_ADR = arg is adr. of format statement
R1642 0 | JSBs to nothing.
R1643 0 |
R1644 0 JSB_FMT0 = JSB_CCB_NO_ARGS,
R1645 0 |
R1646 0 |
R1647 0 | Format interpreter main processing
R1648 0 |
R1649 0 |
R1650 0 JSB_FMT1 = JSB_CCB_FMT1,
R1651 0 |
R1652 0 |
R1653 0 |
R1654 0 | JSB to REC level of index file support
R1655 0 |
R1656 0 JSB_REC_IND = JSB_CCB_A5_R5,
R1657 0 JSB_REC_IND1 = JSB_CCB_A6_R5,
R1658 0 |
R1659 0 |
R1660 0 |
R1661 0 | Record level RMS interface level initialization.
R1662 0 | JSBs to nothing.
R1663 0 |

```

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```
R1664 0 JSB_REC0 = JSB_CCB_R5,  
R1665 0 JSB_REC2 = JSB_CCB_A0_R5,  
R1666 0  
R1667 0  
R1668 0 | + Record level RMS interface level finished one buffer  
R1669 0 | JSBs to nothing.  
R1670 0 | -  
R1671 0  
R1672 0 JSB_REC1 = JSB_CCB_R5,  
R1673 0  
R1674 0 | +  
R1675 0 | Record level RMS interface termination of statement.  
R1676 0 | JSBs to nothing.  
R1677 0 | -  
R1678 0  
R1679 0 JSB_REC9 = JSB_CCB_R5,  
R1680 0  
R1681 0 | +  
R1682 0 | Push current LUB/ISB/RAB: LOGICAL_UNIT is unit no., LUN_MIN is min. no.  
R1683 0 | JSBs to nothing.  
R1684 0 | -  
R1685 0  
R1686 0 JSB_CB_PUSH = JSB_CCB_A2_A0,  
R1687 0  
R1688 0 | +  
R1689 0 | PUT relative with count  
R1690 0 | -  
R1691 0  
R1692 0 JSB_PUT = JSB_CCB_A1_A0,  
R1693 0  
R1694 0 | +  
R1695 0 | Pop current LUB/ISB/RAB  
R1696 0 | JSBs to nothing.  
R1697 0 | -  
R1698 0  
R1699 0 JSB_CB_POP = JSB_CCB_NO_ARGS,  
R1700 0  
R1701 0 | +  
R1702 0 | Return current LUB/ISB/RAB to free storage (open error or close)  
R1703 0 | JSBs to nothing.  
R1704 0 | -  
R1705 0  
R1706 0 JSB_CB_RET = JSB_CCB_NO_ARGS,  
R1707 0  
R1708 0 | +  
R1709 0 | Get adr. of current LIB/ISB/RAB (called only from non-shared routines)  
R1710 0 | since harder to have a data entry vector which is the same  
R1711 0 | if module were to become shared or vice versa.  
R1712 0 | -  
R1713 0  
R1714 0 JSB_CB_GET = JSB_CCB_NO_ARGS,  
R1715 0  
R1716 0 | +  
R1717 0 | JSB to kernel conversion routine  
R1718 0 | -  
R1719 0  
R1720 0 JSB_CVT_KERNEL = JSB_A0_A1_R8,
```


I 13
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15-Sep-1984 23:02:30

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R1721 0
R1722 0
R1723 0
R1724 0
R1725 0
R1726 0
R1727 0
R1728 0

!+ JSB to CALL_VFE routine, args on stack
!-

JSB_CALL_VFE = JSB_NO_ARGS;

! End of file OTSLNK.REQ

J 13
15-Sep-1984 23:44:38
15-Sep-1984 22:44:59

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: 1729 0
: 1730 0

REQUIRE 'RTLIN:OTSMAC';

! Common macros

↑ This file, OTSMAC.REQ, defines OTS macros.
Edit: SBL1039

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Author: T. Hastings

- 1-25 - REQUIRE LPSECT. TNH 19-Dec-77
- 1-26 - Remove SET CB BASE(). JMT 12-Apr-78
- 1-27 - Use RTLIN: Logical name in REQUIRE. TNH 28-Apr-78
- 1-28 - Define ADR_VECTOR. TNH 7-June-78
- 1-30 - Change name to FORMAC.REQ (with apologies to Dick Gruen)
and change name of LPSECT to RTLPSECT JBS 14-NOV-78
- 1-031 - Add a copyright notice JBS 16-NOV-78
- 1-032 - Change file name to OTSMAC.REQ and remove REQUIRE of RTLPSECT.
(Let users of OTSMAC.REQ also REQUIRE RTLPSECT.) JBS 06-DEC-78
- 1-033 - Add offsets and lengths of the dispatch tables. JBS 25-JUN-1979
- 1-034 - Make them weak globals so they can be used by macro routines.
JBS 26-JUN-1979
- 1-035 - Remove FORTRAN offsets and lengths (moved to ISB). JBS for SBL
12-JUL-1979
- 1-036 - Remove BASIC offsets and lengths (moved to ISB). JBS 12-JUL-1979
- 1-037 - Remove PRINT statement, for new BLISS compiler. JBS 02-OCT-1979
- 1-038 - Add COPY_BYTE_A, COPY_WORD_A, COPY_LONG_A, COPY_QUAD_A
macros. SBL 18-Dec-1979
- 1-039 - Add ONE_OF macro. SBL 18-Dec-1981

↑ Macro for writing a character string and then advancing pointer
Designed so that it is placed on the left side of a substitution
statement. Anticipates feature being added to BLISS as a form
for CH\$WCHAR_A (DESPA) if looks good.

L 13
15-Sep-1984 23:44:38
15-Sep-1984 23:02:27

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R1788 0
R1789 0
R1790 0
R1791 0
R1792 0
MR1793 0
MR1794 0
MR1795 0
MR1796 0
MR1797 0
R1798 0
R1799 0
R1800 0
R1801 0
R1802 0
R1803 0
R1804 0
R1805 0
R1806 0
R1807 0
R1808 0
R1809 0
R1810 0
MR1811 0
MR1812 0
R1813 0
R1814 0
R1815 0
R1816 0
R1817 0
R1818 0
R1819 0
R1820 0
R1821 0
R1822 0
R1823 0
MR1824 0
R1825 0
R1826 0
R1827 0
R1828 0
R1829 0
R1830 0
R1831 0
R1832 0
R1833 0
R1834 0
R1835 0
R1836 0
R1837 0
R1838 0
R1839 0
R1840 0
R1841 0
R1842 0
PR1843 0
PR1844 0

```
Call: CH_WCHAR_A (CS_POINTER_ADR.ma.r) = ... ;

MACRO
    CH_WCHAR_A (CS_POINTER_ADR) =
        (LOCAL T;
         T = .CS_POINTER_ADR;
         CS_POINTER_ADR = CH$PLUS (.CS_POINTER_ADR, 1);
         .T<0,8> %;

!+
Macro for writing a character without advancing the pointer.
Desinged so that is placed on the left of a substitution statement.
Anticipates feature being added to BLISS as a form
for CH$WCHAR (DSTPV) if looks good.

Call: CH_WCHAR (CS_POINTER.ra.v) = ... ;

MACRO
    CH_WCHAR (CS_POINTER_VAL) =
        (CS_POINTER_VAL)<0,8> %;

!+
Macros for processing the compiled format text byte strings.

MACRO
    RBYTE_A(P) = (P = .P+1; .(.P-1)<0, 8>) %,
    RWORD_A(P) = (P = .P+2; .(.P-2)<0,16>) %,
    RLONG_A(P) = (P = .P+4; .(.P-4)<0,32>) %,

    CALL VFE(P)=
        T (LOCAL T; T = .(.P)<0,32>; P = .P+4; .T+.P) ( ) %;

!+
Macros for copying values referenced by pointers.

MACRO
    COPY_BYTE_A (S,D) = (D=.D+1; (.D-1)<0,8>=RBYTE_A(S)) %,
    COPY_WORD_A (S,D) = (D=.D+2; (.D-2)<0,16>=RWORD_A(S)) %,
    COPY_LONG_A (S,D) = (D=.D+4; (.D-4)<0,32>=RLONG_A(S)) %,
    COPY_QUAD_A (S,D) = ((.D)<0,32>=.(.S)<0,32>; (.D+4)<0,32>=.(.S+4)<0,32>; D=.D+8; S=.S+8) %;

!+
Macro to complete the transportable character pointer notion.
Everywhere that an address (A) can be specified in BLISS,
allow a character pointer with mnemonic P (rather than CP to keep one letter)

%BLISS32 (
    MACRO
```

M 13
15-Sep-1984 23:44:38
15-Sep-1984 23:02:27

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_S255\$DUA28:[FORRTL.SRC]JOTSMAC.REQ;1 Page 52
(1)

PR1845 0
PR1846 0
PR1847 0
PR1848 0
PR1849 0
PR1850 0
PR1851 0
R1852 0
R1853 0
R1854 0
R1855 0
R1856 0
R1857 0
R1858 0
MR1859 0
R1860 0
R1861 0
R1862 0
R1863 0
R1864 0
R1865 0
R1866 0
R1867 0
R1868 0
R1869 0
R1870 0
R1871 0
R1872 0
R1873 0
R1874 0
R1875 0

LSSP = LSSA %;
LEQP = LEQA %;
EQLP = EQLA %;
NEQP = NEQA %;
GEQP = GEQA %;
GTRP = GTRA %;
MAXP = MAXA %;
MINP = MINA %;);

+
- Clear a vector of BLISS values (transportable)
-

MACRO
FILL VAL (VALUE, LENGTH, ADDRESS) =
%BLISS32 (CH\$FILL (VALUE, (LENGTH) * %UPVAL, ADDRESS)) %;

+
- Allocate string descriptor
Rest of descriptor symbols are defined in SRMDEF.MDL
But currently no way in MDL to define a macro

To declare and allocate a descriptor:

LOCAL
name: DSC\$DESCRIPTOR;

MACRO
DSC\$DESCRIPTOR = BLOCK[8, BYTE] %; ! MDL requires BYTE

THE "ONE OF" MACRO

MACRO

Macros to determine if the value of an expression is one of a set of specified small-integer values. These macros can be used only if the following conditions are met:

The value to be tested is in the range 0 through 127.

The values to be tested for are all in the range 0 through 31.

Example:

IF ONE_OF (.X, 1,3,5) ...

The code generated is much more efficient than a series of comparisons (provided that the values being tested are all compile-time constants).

```
XBMSK [A]=
  %IF NOT %CTCE(A) %THEN %ERRORMACRO('ONE_OF argument not a CTCE') %FI
  %IF (A GTRU 31) %THEN %ERRORMACRO('ONE_OF constant greater than 31') %FI
  (1 ^ (31 - (A))) %,
```

```
BMSK [ ]=
  TO OR XBMSK_(%REMAINING)) %,
```

```
XCMP [A,B,C]=
  %IF %LENGTH EQL 3
  %THEN
    ((A EQLU B) OR (A EQLU C))
  %ELSE
    (A EQLU B)
  %FI %,
```

```
ONE_OF(A)=
  %IF %LENGTH LEQ 1 %THEN %ERRORMACRO('Too few arguments to ONE_OF') %FI
  %IF %LENGTH LEQ 3
  %THEN
    XCMP_(A,%REMAINING)
  %ELSE
    (( ( BMSK_(%REMAINING) ) ^ (A)) LSS 0)
  %FI %;
```

End of file OTSMAC.REQ

R1876 0
R1877 0
R1878 0
R1879 0
R1880 0
R1881 0
R1882 0
R1883 0
R1884 0
R1885 0
R1886 0
R1887 0
R1888 0
R1889 0
R1890 0
R1891 0
R1892 0
R1893 0
R1894 0
MR1895 0
MR1896 0
MR1897 0
R1898 0
R1899 0
R1900 0
MR1901 0
R1902 0
R1903 0
MR1904 0
MR1905 0
MR1906 0
MR1907 0
MR1908 0
MR1909 0
R1910 0
R1911 0
MR1912 0
MR1913 0
MR1914 0
MR1915 0
MR1916 0
MR1917 0
MR1918 0
R1919 0
R1920 0
R1921 0
R1922 0
R1923 0

B 14
15-Sep-1984 23:44:38
15-Sep-1984 22:44:59

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_\$255\$DUA28:[FORRTL.SRC]FORLIB.REQ;1 Page 54
(1)

: 1924 0
: 1925 0 ! End of file FORLIB.REQ

Library Statistics

| File | ----- Total | Symbols Loaded | ----- Percent | Pages Mapped | Processing Time |
|-------------------------------------|----------------|-------------------|------------------|-----------------|--------------------|
| _\$255\$DUA28:[SYSLIB]STARLET.L32;1 | 9776 | 5 | 0 | 581 | 00:01.0 |

COMMAND QUALIFIERS

: BLISS/LIBRARY=LIB\$:/LIST=LIS\$:/SOURCE=REQUIRE SRC\$:FORLIB

: Run Time: 00:19.9
: Elapsed Time: 01:19.3
: Lines/CPU Min: 5818
: Lexemes/CPU-Min: 26644
: Memory Used: 164 pages
: Library Precompilation Complete

0181 AH-BT13A-SE
VAX/VMS V4.0

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FORIOELEM
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